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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL.

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JANUARY TO DECEMBER,
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ERRATA

IN

PROCEEDINGS, ASIATIC SOCIETY OF BENGAL, FOR

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- Page 5, line 4 from bottom, *for* conquer *read* conquer.
- " 46, " 22 from top, *for* P. H. D. *read* P. W. D.
- " 52, *for* footnote, *read* * about £ 480.
- " 54, line 13 from bottom, *for* common *read* common.
- " 51, " 3 from bottom, *for* denymphe *read* de nymphe.
- " 66 is wrongly numbered 62.
- " 69, line 7 from top, *for* Crawford *read* Crawford.
- " 76, " 21 from top, *for* excess *read* excess.
- " 76, " 3 from bottom, *for* Shisticeps *read* schisticeps.
- " 80, " 8 from bottom, *for* Waughton *read* Wangtu.
- " 131, " 2 from top, *for* 6th April *read* 6th June.
- " 134, " 6 from top, *for* under *read* under.
- " 139, " 23 from top, *for* specifics *read* specifics.
- " 150, " 7 from top, *for* June *read* May.
- " 195, " 2 from bottom, *for* Monogamy *read* Polygamy.
- " 257, " 2 from bottom, *for* the volume *read* volume XLIII, part 1.

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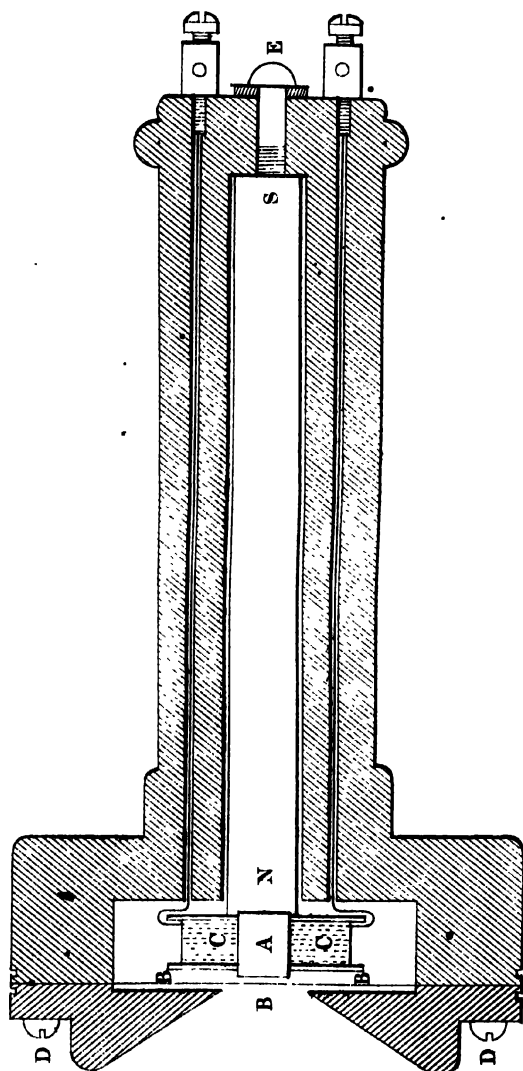
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PROFESSOR GRAHAM BELL'S TELEPHONE.



FULL SIZE

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR JANUARY, 1877.

• The Monthly General Meeting of the Asiatic Society was held on Wednesday, the 17th January, 1877, at 9 o'clock P. M.

The Hon. Sir E. C. Bayley, K. C. S. I., President, in the chair.

The Minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the author, a copy of "Remarks on the Sikshâs," and "Kât-yâyana and Patanjali, their relation to each other and to Pâṇini." By F. Kielhorn, Ph. D.

2. From the Superintendent Geological Survey of India, a copy of a work entitled "Eastern Persia, 1870-72"; Vol. I, "Geography with Narratives", by Sir F. J. Goldsmid; and Vol. II, "Zoology and Geology", by W. T. Blanford.

3. From the author, a copy of the "Arian Witness, or the Testimony of Arian Scriptures in corroboration of Biblical History and the Rudiments of Christian Doctrine." By the Rev. Dr. K. M. Banerjea.

4. From K. Kuroda, Chokuwan of Kaitakshai, Tokei, Japan, a copy of a work, entitled "Reports and Official Letters to the Kaitakushi", by Horace Capron, Commissioner and Adviser, and his Foreign Assistants.

5. From Bábu Rám Dás Sen, a copy of his "Aitihosika Rahasaya, Vol. II,

•
The following gentleman, duly proposed and seconded at the last Meeting, was balloted for and elected an ordinary Member.

Kunnara Radha Kishor Deb, Juvráj of Hill Tiperah.

Dr. J. Muir, proposed by the Council at the last Meeting as an Honorary Member, was balloted for and duly elected.

The following are candidates for ballot at the next Meeting :

1. Mr. William Crooke, C. S., Goráhpur, N. W. P., proposed by Mr. V. A. Smith, seconded by Mr. H. Blochinann.

2. Capt. G. F. L. Marshall, R. E., proposed by Mr. J. Wood-Mason, seconded by Major H. H. Godwin-Austen.

THE PRESIDENT announced that the Council had contributed a sum of Rs. 500 in aid of a Zoological Exploration of Tenasserim, and that the same had started fully equipped under the charge of Mr. Limbörg. The results of the expedition would be published in the Society's Journal.

THE PRESIDENT exhibited the following silver coins and said—

"The ten coins, which form the remainder of the batch recently purchased from the Persian Gulf, belong to the group termed by Mr. Edward Thomas "Partho-Persian", which probably belonged to minor rulers in more or less subordination to the Parthian kings, the style of whose coins they follow in many respects.

"The coin which I have marked No. 1 appears to be identical with that marked as No. 3, of the plate given by Mr. Thomas in his paper on the Pehlevi Legends on Arsacidan Coins. Unfortunately the present coin is in bad preservation. No. 2 is a small coin of the same general type, *i. e.* with a head on either side, but the reverse head is bearded. The legend on the obverse is absent, but there is one on the reverse of which a few letters may be perhaps read as ايزا "Aeza". All the other coins have the "Moba" and the fire altar on the reverse, and of these No. 3 seems to assimilate with the coin numbered by Mr. Thomas as 6 on his plate, the legend of which he admits to be doubtful. Nor can I venture to offer any decipherment of my own. The coin, though in good preservation, is very rudely executed.

"The coin I have marked as No. 4, approximates to that figured as No. 8 of Mr. Thomas's plate, but the legend in front of the fire altar seems to read not quite as in his coin ارتخشتر (1), (A)rethashtar, or Artaxerxes. I cannot pretend to offer any decipherment of the other coins; they are of rude execution, and the alphabet is one with which I am not familiar. I notice that two of the heads have, instead of the high Parthian cap, a triple pointed crown."

The following papers were read—

1.—*On Himálayan Glaciation.*—By J. F. CAMPBELL, Esq.
(Abstract.)

Mr. CAMPBELL's observations refer to the outer Himálayan region between the Ganges and the Rávi, including the higher hills at Masúri and to Narkandá, north of Sinelá. Within this area he could not find one 'perched block,' one hog-backed ridge, or one rounded valley. Everywhere far and

near he found the V-shaped form of denudation, attributable solely to rain and river action. In the superficial or the older conglomerates, however coarse, he could find no case of an erratic boulder-bed, nor anything like a moraine, and nothing to suggest the agency of floating ice in lake or sea. He considers that the great blocks so freely distributed in the Kánggrá valley are sufficiently accounted for as torrential deposits, by the very rapid fall of the streams from the Dhaoládhar range, aided probably by a once heavier infall and a corresponding increased snowfall on the summits. There is, he thinks, to support the notion of an 'Ice-cap', or even of a 'glacial riot', in the now current sense of that term.

The author gives some interesting antiquarian observations upon the traditions connected with the great boulders.

MR. MEDLICOTT agreed with Mr. Campbell that no actual glacier had ever reached the Kánggrá valley, but thinks that ice had much more to say to the big stones than Mr. Campbell allows. The former great extension of Himálayan glaciers is established from indisputable observations in Sikkim and elsewhere. At that time ice must have been in force on the Dhaoládhar range, close over the Kánggrá valley. Further, the period of this Himálayan glaciation agrees, so far as can be determined, with the ice-age of the western continents.

MR. H. F. BLANFORD said that he had expected that Mr. Campbell's paper would be much more subversive of accepted views, than proves to be the case. The notion of an ice-cap extending from the pole over the Himálaya to the neighbourhood of the equator, against which Mr. Campbell's argument is directed, was to him a new one, and, as far as he was aware, stood in no need of refutation. As regarded the view held by himself and not a few other Indian geologists, *viz.*, that in the latest geological times there had been a very great extension of the existing glaciers, and that glaciers were then formed at levels far below the present snow line, the validity of the existing evidence of Dr. Hooker's and Mr. W. T. Blanford's observations in Sikkim, and Major Godwin-Austen's in the Nágá Hills, did not seem to be in the least affected by Mr. Campbell's failure to discover ice markings on the great boulders on the flanks of the Dhaoládhar. It would be in the recollection of members of the Society that in papers published in the Society's Journal, Mr. W. T. Blanford had recorded the existence of moraines in Sikkim down to 6000 feet, and that Major Godwin-Austen has figured and described the beautiful examples of moraines, which he had discovered in the Nágá Hills at elevations of no more than 1500 feet. Having lately visited Naimitál, he thought he might adduce the site of this well-known station as another example of glacier action. The form of the valley, more especially the northern face, is strongly suggestive of ice denudation, the face of the slope

being planed off, as by the friction of a glacier; and presenting none of those subordinate ridges and spurs which are especially characteristic of drainage denudation. The lake is dammed below by a heap of blocks, some of gigantic size, which appear to be of the same hard limestone as forms the ridge at the head of the valley. Having been only two days in Nainítál, he had been unable to investigate the question satisfactorily, but his impression was that the lake was closed by a moraine. A leisurely examination of Nainítál and the other lakes in the vicinity would be an interesting and profitable employment for a geologist passing a season at one of the Kamóu hill-stations. Nainítál is at an elevation of only a little over 6000 feet, so that the supposed origin of the lake would fit in well with the facts recorded by previous observers. Glaciers do not now descend even in the Sikkin Himálaya below 14,000 feet, and to bring them down to 1500 would imply a reduction in the mean temperature of about 20° Fahrenheit.

He was quite unable to accept Mr. Campbell's suggestion that any considerable extension of the existing glaciers of the Himálaya could be accounted for by an increased supply of vapour, such as would be afforded, were, for instance, the Indus valley covered by the sea. The outer slopes of the Sikkin Himálaya now receive some of the heaviest rainfall in the world, the annual average recorded at Buxa Fort being 210 inches; yet the glaciers of Sikkin do not reach below 14,000 feet. His own belief was that the former extension of the glaciers could be explained only by a very great depression of the general temperature, possibly a reduction of the sun's heat, since the sun is known to be a variable star of short period, and may be so to a much greater extent, in long periods. But he did not think the evidence pointed to a greater reduction than he had suggested.

Major GODWIN-AUSTEN said—I quite concur in the remarks of Mr. Medlicott on the paper we have just heard read. In Kashmír undoubted traces of glaciers are to be seen, as low as 5000 feet in all the large valleys, in the grooved surfaces of the rocks on the sides of the valleys; and such glaciers once extended down to the gorges where the larger rivers enter the plain of Kashmír. Even at a lower elevation in the Jhílam valley, below Bárahmúlá, traces of such action are to be seen.

Very large masses of stone can be carried for long distances by the action of water alone, and I have seen many 10 to 12 feet in length, carried along on the bursting of a small glacial lake. When the Dhaoládhar range was covered with ice and snow, down to within 1000 or 2000 feet of the place where the large blocks alluded to by Mr. Campbell now lie, it is easy to conceive their mode of transport and deposition being due to the proximity of those old Dhaoládhar glaciers.

Dr. H. CAYLEY said—The power that floating ice possesses of carrying large blocks of stone long distances from the glaciers whence the ice was

derived is well shown in the Nubra Valley in Ladák. In this valley, both below its junction with the Shyok and also up the valley of the Shyok river, are to be seen here and there enormous blocks of granite, some as big as a cottage, lying at various distances from the bed of the river. These blocks are from the mountains near the Kumdán glaciers. A few years ago, these glaciers extended across and blocked up the upper valley of the Shyok river. After a time, the ice barrier gave way before the force of the water above, and enormous masses of ice were carried down by the flood through Shyok and Nubra Valley, and deposited these blocks of stone in their course.

An Imperial Assemblage held at Delhi 3000 years ago.—By RÁJENDRA-LÁLA MITRA, LL. D.

(Abstract.)

The ceremony of Imperial baptism was, in ancient times, called the *Rájasúya*, and the Aitareya Bráhm̐na of the Rig Veda gives a list of ten persons who had celebrated it in remote periods of antiquity. The one best known to the people is, however, that which was celebrated by the Pándava brothers. It had a twofold character; first, the subjugation of a large number of princes and chiefs who had to acknowledge allegiance and vassalage; and secondly, a round of sacrifices and ceremonial observances spreading over a period of one year and a fortnight, from the full-moon day of March to the first new-moon of the year following. The observances of the first four months were in some respects similar to the Lent of the Christian Church. On the last day, after the offering of many oblations to the fire, the chanting of innumerable Sáma hymns, and repeated invocations of the Vedic gods Indra, Savitá, Rudra, Soma, and the Maruts, eighteen different kinds of fluids were consecrated and showered on the king through a golden rosehead. The king was then made to take three steps forwards towards each of the four quarters of the globe, and then, mounted on a chariot, driven towards a herd of cattle, the foremost animal of which he touched with the tip of his bow in token of his having accomplished a successful cattle-lifting raid. Sacrifices of a bull, a pregnant heifer and some goats next followed. The king offered an *arghya* to the most revered among his guests, and received the allegiance of his allies, tributaries, vassals, and friends; and the ceremony was brought to a conclusion by the priests offering to the newly-anointed sovereign a cup of Soma beer and a goblet of arrack, which he quaffed. The object of the ceremony is stated to be that the person inaugurated by it "should conquer in all the various ways of conquest; to subjugate all people; that he should attain to leadership, precedence, and supremacy over all kings, and attain everywhere and at all times to universal sovereignty, enjoyment of pleasures, independence,

distinction as a king, the fulfilment of the highest desires, the position of a king, of a great king, and supreme mastership; that he might cross with his arms the universe, and become the ruler of the whole earth during all his life, which may last for an infinitely long time; that he might be the sole king of the earth up to its shores bordering on the ocean.

Owing to the lateness of the hour, the President postponed the reading of the following papers to the next meeting—

1. *Rough Notes on some Ancient Sculpturings on rocks in Kamā similar to those found on monoliths and rocks in Europe.*—By H. RIVER CARNAQ, C. S.

2. *On the Final Stage in the Development of the Organs of Flight Orthoptera.* By J. WOOD-MASON.

3. *List of the Mollusca collected by Dr. J. Anderson in Yunan and Upper Burmah, with descriptions of new species.* By G. NEVILL, C. M. Z. S.

4. *List of the Mollusca collected by the late Dr. Stoliczka when attached to the Embassy under Sir D. Forsyth in Yarkand and Ladak, with descriptions of the new species.* By G. NEVILL, C. M. Z. S.

The Meeting then adjourned.

At the request of the Government of Bengal, the Council have much pleasure in reprinting, for the information of the members of the Society, the following sketch by Mr. Cust of the progress of the researches in the Non-Aryan languages of India, which was originally written for the London Philological Society. They agree with Mr. Cust that vocabularies of the Non-Aryan languages are not wanting; but that it is desirable to proceed beyond that stage of inquiry and encourage the composition of practical grammars, and thus lead the way to the drawing up of comparative grammars for the several families of languages.

The Council have every reason to hope that this important *desideratum* will in course of time be supplied; and that some Members of the Society may have leisure to carry out the valuable suggestions made by Mr. Cust.

On the Non-Aryan Languages of India.—By R. N. CROFT, Esq.

In the Annual Report [of the Philological Society] for 1875 a note is inserted on the Aryan and Southern Dravidian languages of British India and its Political Dependencies, using the latter phrase in its most extended sense without reference to the texts of treaties. The out-turn of grammars and dictionaries recorded in that note represents the work of the last quarter of a century. It is now proposed to indicate the languages spoken by residents of British India (exclusive of British Burmah) other than

Aryan and Southern Dravidian. Our researches will extend to tracts of country under native sovereigns more or less dependent, and to the wild tribes which inhabit the mountain fringe of the eastern border, or the imperfectly known uplands of Central India. In this direction emphatically lies the work of the next quarter of a century, for the harvest is ready, and the opportunity is offered, if workmen are forthcoming. For scant vocabularies and grammatical notes must be substituted in cases good practical grammars, and in some cases scientific grammars which will in due course be followed by scientific comparative grammars and dictionaries, embracing cognate groups, and thus making substantial contributions to the sum of linguistic knowledge in a most interesting direction—*viz.*, just at the point, where the monosyllabic structure gives way to the earliest development of the agglutinating method.

Following the same geographical order as the one adopted in last year's note, we commence at the northern angle of India: at the spot where the three religions of Mahomet, Buddha, and Brahma, with their respective languages and written characters, converge. This spot is situated in the territory of the Maharaja of Cashmere, one of the great feudatories of the Empire. To the north of Cashmere proper is Little Tibet, or Bultistan, the capital of which is Iskardo, on the river Indus: in the population there is an admixture of Mahomedanism: the language is ostensibly Bhot or Tibetan, but there is occasional use of an Arabic written character; in fact it is debatable ground: but in the adjoining Middle Tibet, the capital of which is Ladakh, the population is Buddhist, and the language Tibetan, written in the character peculiar to that language, though derived from the Nagari. The population of both Little and Middle Tibet is civilized in the Asiatic sense, and resides on the highway of a future commerce betwixt British India and the great plateau of Central Asia, the scene of the future conflict betwixt China, the Mahomedan powers, and Russia.

Moving south-east, and crossing the Chenab river in the mountains, we enter the Province of Lahoul or Spiti, within the District of Kangra, and a component part of the Province of the Punjab. There, amidst lofty mountains, in hitherto inaccessible tracts, amidst a sparse and pastoral population of Buddhists, the school-master and missionary have located themselves, and in 1865 and 1866, at Kyelang, the capital of Lahoul, the Rev. H. A. Jaeschke, a Moravian missionary, lithographed a short practical grammar in English of the Tibetan language, with special reference to the spoken dialect and the wants of his mission, and a Tibetan and English Dictionary. He is now employed in Europe in the preparation of a superior work on the same language. This, perhaps, is the only portion of British India proper where the Tibetan language is spoken; but Tibet, with its capital Lhasa, is conterminous with the territories of our ally the Maharaja

of Nepal, and its prolific literature finds its way from native printing-presses of the Chinese type into that kingdom. Poor traffickers and monks annually visit Kathmandu, and sell books of inferior pretensions, as well as religious tracts. It is a language in the stage of transition from the monosyllabic to the agglutinating class, but akin to Chinese, of which empire Tibet is an integral portion: the people are Buddhists, and allow of no communication, even by letter, with British India, its Government, or people: but from India many centuries ago they borrowed their religion, and the staple of their literature, which consists chiefly of religious works and translations from Sanskrit. The first grammar of this language compiled by Csoma di Körös, after a long residence on the frontier, and published at Calcutta in 1834, followed by a dictionary: to this succeeded a grammar published in the German language, in Russia, by Schmidt, in 1841; and another in French by Foucaux at Paris in 1858: neither of the two last-mentioned scholars had visited India, and they are but followers of Csoma di Körös. Parts of the New Testament have been translated into Tibetan, but there is an absolute dearth in the whole of Europe of Tibetan scholars, and at a late meeting of the Geographical Society of London, a letter was exhibited from the Lama to a British officer, upwards of one hundred years old, which, whatever may have been the case then, is totally beyond the existing knowledge of the linguistic world in Europe. It is understood that there are several dialects of Tibetan, and, considering the vast extent and mountainous character of the great plateau, there is reason to expect scores of dialects. There are four variations of the alphabet—the first is in *capitals*: the second *small* letters: the third *cursive*: and the fourth an exotic, supposed to be identical with one of the Nepalese alphabets: all are derived from the Nagari.

Between Lahoul and the Nepalese frontier a considerable extent of mountainous country extends, occupied from time immemorial by a population professing Hinduism, but with some suspiciously non-Aryan customs, such as polyandry, speaking a dialect of Hindi, and under the rule of petty Rajas, in absolute dependence on the Government of British India. In one solitary tract north of the river Sutlej, and deep in the Himalaya, is found to exist a population speaking a non-Aryan language; this is Kunawur, a portion of the territory of the Raja of Bussahir, a small tract of mountains of an enormous elevation, occupied by a population of less than ten thousand, the majority of whom are Buddhists, and speak a language called Koonawuri or Mlehan, akin to Tibetan, a vocabulary of which was compiled by Captain Herbert. There are said to be a variety of dialects even in this narrow compass. The people, though simple in habits, are not uncivilized in the Asiatic sense, and in the chief Buddhist temple is an extensive library of Buddhist works.

Crossing the rivers Jumna and Ganges in the mountains, and traversing the Hindu hill tracts of Kumaon, we reach the upper portion of the river Gogra or Surju, and find ourselves within the boundaries of the kingdom of Nepaul, within which, in its long extension of many hundred miles to the frontiers of Sikkim, we find a score of non-Aryan languages, spoken by tribes, partly Hindu, partly Buddhist, and partly Pagan, dwelling in the valleys of the Himalaya, where the loftiest range on the face of the globe separates Buddhism from Hinduism, the Mongol from the Aryan, the Tibetan language and its congeners from the great Sanskrit vernacular.

This group may be called the 'Himalaic': to call them Bhutiya is correct linguistically, as that word in its general sense is synonymous with Tibetan, and in its special sense with the dialect of the kingdom of Bhutan: to call them sub-Himalaic is geographically incorrect, and some of the tribes inhabit the highest valleys: to call them Gangetic is to mislead, as they are spoken hundreds of miles from the Ganges, although the drainage of the southern watershed finds its way to that river. Here the most eastern wave of Aryan civilization rolls up against as impassable a barrier, as the Kelts on the western wing of the Aryan army found in the Atlantic Ocean. Had not the mountains presented a physical obstacle, the elder culture, which Tibet had imported from China, would have given way to the fresher culture established at Kanouj and Benaras: in spite of the mountain barrier, Tibet received from her Aryan neighbours her religion, her literature, and her written character, but she has conserved to this day her own language, and her own type of civilization, by enforcing with success a system of absolute isolation, which it must be the work of the next quarter of a century to break down.

All the languages of this group are more or less connected with Tibetan. Analogies with other groups are asserted: the great ethnological question lies before us, whether all these tribes crossed the Himalaya from Tibet at a period antecedent to the introduction of the Buddhist religion, or whether some migrated from Central India, or supplied colonies to Central India, from which they are now separated, and have been for centuries separated, by the great wave of Aryan immigration down the valley of the Ganges. It is maintained that their numerals, pronouns, and postpositions, are frequently identical. The Himalayan range is intersected by four great feeders of the Ganges, the Surju or Gogra, the Gandak, the Kosi, and the Tista: there is also a transverse section of lofty hills, of mountainous region of moderate height, and submontane tracts. In the lofty sites are found the Tibarshad and Hundesi languages. In the submontane tracts are found the Chepang, Vayu Hayu, Kusunda. In the western portion of the middle region we come across the Sumwar and Surpa; in the central portion is the important Newar, the Magar, Bramhu, Darahi,

Denwar, Pahari, Kaswar, Pukhya, Thaksya. In the eastern portion are the Limbu, Kiranti, Murmi, and Gurung. In the adjoining kingdom of Sikkim is the Lepcha language, and in the kingdom of Bhutan, or Bhutant (the end of Bhut), is the Bhutiya proper. We have it on the highest authority that none of these languages are intelligible to others than the speakers, and that, with the exception of the Newar and Lepcha, they are absolutely devoid of literature and of a written character. The Newar has a few translations, but no dictionary or grammar. Mr. Hodgson has supplied a comparative treatise of Newar and Tibetan.* The Newar has no less than three alphabets, but all derived from the Nagari.

The sanitarium of Darjiling is situated in Sikkim, and this has led to the Lepcha language being utilized by Protestant missionaries. Portions of the Bible have been translated into it, and other books of an elementary character: this language is closely allied to Tibetan, but according to Csoma di Körös it had a non-Tibetan alphabet. A dictionary of this language had long been in preparation by Colonel Mainwaring, a resident at Darjiling, and a manuscript grammar by the same hand is in existence. The Lepchas and their neighbours, the Bhutiyas, are both Buddhists; so far they resemble each other, but the latter burn their dead like Hindus, have no form of marriage at all, and practise polyandry; the former bury their dead, and are monogamists. This is a fair instance of the extraordinary diversities of customs, cutting to the root of family life, under the same religious externals. With regard to the Kiranti language, it is asserted, that the complex pronominalization of the verb points to a special connexion with the Mundari, or Kolarian, language of Central India: analogies of formation of the same language with the Dravidian are also indicated. The tribe is also Pagan in the midst of Buddhists.

With the above exceptions we know little or nothing of any of these twenty-two languages or dialects of the same language (for we cannot say which), beyond the vocabularies carefully collected by Mr. Bryan Hodgson, late Resident of Nepal, a man who has done by patient research, and the devotion of a life, more for the advance of linguistic knowledge than any of his contemporaries. All subsequent vocabularies seem to be but repetitions of his labours. One of the dialects of Bhutiya proper appears to be called Changlo: the people who speak it are in the middle region of altitude, of a dark colour, which is indicated by their name, which means 'black'. This language introduces the name of another meritorious labourer in this great and unexplored field. Mr. William Robinson, Inspector of Schools of Asam, in 1849 compiled a short but serviceable grammar, or rather

* There are Grammars and Vocabularies of Tibarshad in the Journal of the Bengal Asiatic Society; and a Grammar of the Magar, published by Mr. Boames, 1869.

wrote down some practical grammatical notices of this dialect,* which give a far better insight into its structure and characteristics than any vocabulary : this excellent service he rendered to several other languages spoken in the neighbourhood of the Asam valley, in a manner well calculated to bring out the salient features of each. The alphabet of the Changlo is the same as the Tibetan, to which language it bears a close resemblance. A reprint of Mr. B. H. Hodgson's scattered papers, revised and corrected by that veteran scholar, has long been ready for the press, and one volume has usually appeared : the second volume is anxiously expected, as it will contain a reprint of the author's papers on the Kooch, Bodo, and Dhimal, on one hand, and of the Váyú and Báhing on the other, and we can state, on the authority of Mr. Hodgson, that there is distinct evidence of the existence of two classes of languages : one of them, represented by the Váyú and Báhing, may be called the pronominalized or complex type : the other, represented by the Newar, Lepcha, and others, is the non-pronominalized or simple type. By the term is meant the use of the pronouns in the form of affixes and suffixes, the most familiar instance of which is known to us in the Hebrew language. It is clear, therefore, that the present classification of these languages is only provisional.

The Himalaic group may be said to have no future before them, and they only await the time to be improved off the face of the earth : under ordinary circumstances it might have been expected that to one of the group at least—notably the Newar—might have fallen the chance of becoming the political language of the whole tract, and thus (like the South Saxon, and the patois of the Isle de France) developing itself into a national language. But such can never be, for the intrusive Khass, or Parbatia variety of the Aryan vernacular of India, under the name of Nepalese, is already established at Kathmandu, the capital of the Gurkha dynasty. The civilization and religion of the court and the nobles is Hindu, and as this gradually extends, all that is Tibetan and Trans-Himalaic will be trodden down by its powerful and vigorous rival, which receives its new ideas from India, and not from Tibet. The non-Aryan languages are already affected by their Aryan neighbour, and are charged more or less with loan-words, and in some cases even the numerals have given place, and such a change made, that the classification of the living language begins to be ambiguous. As an instance of transition these languages will remain objects of interest, but no more.

Proceeding onwards in a south-easterly direction we come upon new languages, which, for the sake of sub-dividing a large subject, rather than from any well-defined distinctive type of language, have been grouped under the head of Lohitic, a fanciful and inappropriate name from one of

* The vocabularies and grammatical notices alluded to are to be found in the *Journal of the Bengal Asiatic Society*.

the less familiar names of an affluent of the Burhampooter or Sampoo, which, entering British India at the extreme eastern point of the valley of Asam, for some distance flows westward betwixt two ranges of hills: at a certain point the southern range ceases, and the great river flows round this point, and altering its course discharges itself into the Bay of Bengal: on each side of this river, as it flows through the valley, are tribes speaking distinct languages, with a population calculated at little less than a million. We shall perceive, when we look at them closer, that, except in geographical sense, or for temporary convenience, this grouping cannot be maintained. It was the original opinion of Mr. Hodgson that all the languages were Tamulian, a general phrase, by which he intended non-Aryan or aboriginal. Dr. Caldwell has convincingly shown that, if by Tamulian was meant Dravidian, of which group Tamil is the chief member, the analogies pointed out betwixt Dravidian and these languages are less numerous, and of less essential character, and less distinctive, than the analogies which exist between the Finnish and the Dravidian, of a vague and structural character common to all languages of a Scythian origin. Max Müller maintains, that no trace of Dravidian has as yet been discovered north of the Ganges. In the Dravidian, which is at a much more advanced stage of the agglutinating class, there is an entire absence of intonation; while in the Lohitic languages, as in the Chinese, they are conspicuous: indeed, Mr. Robinson describes four different intonations prevalent in the language bordering the Asam valley; and he maintains, that all these languages were originally monosyllabic, though gradually passing into the earlier stage of agglutination.

The first in order, as we enter the valley, are the Bodo, called also Borro and Kachari, and Dhimal, of which Mr. B. Hodgson has published a grammar and vocabulary. The same author furnishes particulars and a vocabulary of the Kooch language: the inhabitants of Kooch Behar have abandoned their ancient agglutinating language, and adopted a bad Bengali: they have become partly Muhammadan and partly Hindu: a small section have clung to their ancient faith and language, which is known as Pani-Kooch, and an examination of this residuum of an almost extinct unwritten language has led Col. Dalton to found the opinion, that it belongs to the Dravidian family, and has no connexion with the Kooch. The Kachari language, above alluded to, is also known as Meeh. Mr. Robinson has supplied a grammar of this language, and Major Lance, Deputy Commissioner in Asam, has another in preparation: there is no written character, and the number of people who speak this language amounts to 60,000.

Following the range of mountains eastward, we come upon a race of downright savages and Pagans, practising polygamy and polyandry, who receive a black-mail from the Government of British India to compensate

for the lost privilege of making raids on the peaceful settlers in the valley : the Aka, whose language is known to us by a vocabulary prepared by the Rev. Mr. Brown, and another in the *Journal of the Bengal Asiatic Society* ; the Abor, of whose language we have a vocabulary prepared by Captain Smith ; the Doffla, of which we have a grammar by Robinson : the Miri, of whose language we have a grammar prepared by Mr. Robinson ; this tribe appear to have supplied interpreters to communicate with the others : and it is asserted that the word 'Miri' means 'go between', and is identical with the word 'Meriah' of the Khonds, so famous in connexion with the human victims sacrificed by that tribe ; the Mishmi, of whose language we have a vocabulary by the Rev. Mr. Brown. These tribes extend back through unknown tracts to the frontier of Tibet, and are under a very imperfect control on the part of the Government of British India.

At this point—the head of the Asam valley—we cross the Burhamputer River, and find traces of new linguistic influence, for we are not far distant from the boundaries of China proper ; and the Khamti language, of which we have a grammar by Robinson, is a member of the great Thai or Shan family, of which the Siamese is the political head. This tribe is but the representative of much larger and unknown hordes in Bor Khamti within the Burmese kingdom : they are civilized Buddhists, and have friendly relations with the Anglo-Indian authorities. At one period the Shans conquered the whole valley of the Burhamputer : the settlers assumed the name of *Khām*, from the Sanskrit *asama*, 'unequalled' : like the Normans in France, they gradually lost both their language (Shan) and their religion (Buddhist), and still constitute a large portion of the population of the valley, under the name of *Khóm*, as Asamese-speaking Hindus : only a few priests have preserved the ancient religion. It is worthy of remark that the valley is called Asam, and the people call themselves *Ahāma* from *Asāma* also. There is another Shan language, the Aiton, of which we have a vocabulary in Sir G. Campbell's *Specimens of Languages*. The Khamti has a strong resemblance to the Siamese : it is purely monosyllabic, and more strongly accented than the other languages on the Asam frontier : it is in some degree connected with the Chinese itself, as the intonations are so finely modulated, that sounds organically the same express a totally different idea : inflections are unknown : the alphabet is derived from the Burmese.

Adjoining the Khamti is the Singpho tribe, whose language occupies a transitional position betwixt Tibetan and Burmese : one-fourth of its vocables are allied to Burmese, and one-fourth to Manipuri. This tribe is also the representative of a much greater horde lying behind, known as the Kakhyen, who occupy the hilly tract betwixt Burmah and Yunnan in China. Mr. Robinson, assisted by Mr. Bronson, has compiled a grammar of the

language: it is said to have a Shan alphabet. The Singhpos are civilized, but Pagans. It must be remembered that the point at which the Burhamputer bursts the mountain rampart into India is linguistically, politically, and ethnologically, one of the highest importance. The last and weakest tidal stream of the great Aryan river of religion, language, and civilization, flowed languidly up the Asam valley. More than once in history it has been met by a Shan counter-current, and may be met again! The incursion of the border-tribes into settled valleys is often an unwilling effort to escape from a superior force propelling them from their own haunts. This outlet no doubt in times past the population of India has received great additions, though the superiority in number and calibre of the invaders from the North have borne them down; and the Aryan settler under Hindu, Muhammadan, and Christian rule, has held its own.

The distance on the map from the extreme point of the southern mountains of the valley of Asam to Rajmahal, the extreme point of the Vindhya range, is, as the crow flies, not so great as to forbid the idea that India has been occupied at remote periods by pre-Aryan immigrants from the gorge of the Burhamputer; but we await a more scientific comparison of languages, and more complete ethnological research, before the theory can be firmly substantiated, that the so-called Nisháda black aborigines were actually immigrants from the East.

After crossing the Burhamputer, the mountains return on the south side of that river in a westerly direction, enclosing the valley within a horse-shoe. Next to the Singhpo come the atrocious savages and Pagans, the Naga, over part of whose territory the Anglo-Indian Government has thrown a loose control, the nature of which can be best illustrated by the fact that within the last year they have killed their English Superintendent. Behind these lies the Burmese empire, and beyond the boundary the country is absolutely unknown: there are numerous clans of these turbulent highlanders, with a variety of dialects: of one at least Mr. Robinson, aided by the Rev. Mr. Brown, has prepared a grammar. The vocabularies of several of the Naga tribes are in the *Journal of the Bengal Asiatic Society*. A vocabulary of ten dialects has been published in the *Journal of the American Oriental Society*.

Next in order along this range are the Khasia or Cossiyah, and Jyntea, remarkable for their republican form of government and their monosyllabic language, akin to the Thai family, of which there is an excellent grammar by the Rev. Mr. Pryse, and an Anglo-Khasia dictionary by the Rev. Mr. Roberts: also a grammar by Robinson, and another published at Berlin by W. Schott: there is also an essay by the late Baron H. C. von der Gabelentz, published at Leipzig, 1850: the New Testament has been translated into this language. They were Pagans.

Proceeding westward we come to the Garo tribe: their language has been thoroughly studied, and translations made into it by the American missionaries for educational purposes. We have a grammar by Robinson and T. J. Keith, and a dictionary by Keith, as well as a vocabulary by Ram Nath: Keith considers that the language has Aryan affinities, while Robinson compares it to Tibetan, and a connexion of the Garo with the Achari on the other side of the valley is asserted, and is probable. They are Pagans, and surrounded on three sides by Hindu-settled districts; yet till very lately nothing was known of them.

Between them and the Asam valley is the tribe of Mikir, with a population of twenty-five thousand; a grammar of their language has been prepared by Robinson. They are a peaceable and settled people, though Pagans.

Such are the tribes surrounding the valley of Asam, and the exact position which each tribe bears to the Government of British India is not easily defined. Some are entirely subjects, and are good subjects: some are entirely independent, and most uncomfortable neighbours, but they are included in our political system as against the outer world: some pay revenue, some receive black-mail, some are Pagan savages, some civilized religionists of one of the known types.

We now return to the Naga Hills, and follow the mountain range which separates Burmah from British India. Just outside the boundary, but under treaty, is the kingdom of Manipuri. We have vocabularies of the Manipuri language by Mr. Hodgson and the Rev. Mr. Brown, and an English, Bengali and Manipuri dictionary. There is also a Manipuri grammar in the Journal of the Bengal Asiatic Society. The New Testament has been translated into Manipuri. They are a civilized people, and Hindus.

Proceeding southward we find in unsurveyed and impenetrable wilds, extending three hundred miles, the Kukis, one clan of which is well known from the late campaign, as the Lushais, and the more southern clan as Howlong and Sylu. Of their languages we have vocabularies by Captain Lewin and Major M'Culloch. In 1874, Captain Lewin published a valuable treatise: he explains that the people call themselves 'Dzos', that they have twelve tribes and dialects, but that the Lushai is the clan-language of all: that they never had a written character: that the main features of the language are agglutinative, as the root remains unchanged, suffixes being added, and the governed word precedes in the sentence the governing word. They are far from savages, though Pagan; they are civilized in the Asiatic sense, and exercise certain arts.

On reaching the hill districts of Chittagong we arrive very near the Bay of Bengal. These mountains are occupied by three classes. 1. The

Khyoungthi, who are Buddhists, fairly civilized immigrants from Arracan, speaking a dialect of the Aracan language: their written character is the same as Burmese, which is in fact a branch of the same stock: it has a strong affinity to the Tibetan group. 2. The Chukmas, of uncertain origin, who are Buddhists, merging into Hindus, at the same time that their Aracanese language is yielding to corrupt Bengali. In their language words can be traced which belong to neither. 3. The Toungtha, of mixed origin, if not the aboriginal inhabitants of the district, and more savage than the above-named. Among these are the Tiperahs, or Mrongs, Ku Mroos, Khyengs, who are subject to British India: Bungees, and Pankho, who are partially, and Lushai-Kukis above-mentioned, Shendus or Lakheys, who are entirely independent. All are Pagans, and most are savages. There is a vocabulary of the Khyong language by Major Fryer, and of New Kuki by Lieut. Stewart, both in the Journal of the Bengal Asiatic Society. There is a vocabulary of the Tiperah language, but no written character; the same remark applies to the others. Little is known of the Shendu, but there is a vocabulary by Captain Tickell.

Proceeding southward we should enter British Burmah, from which for the present we abstain, and crossing the Bay of Bengal to land in Cuttack, we complete the circuit of the province of Bengal by enumerating the non-Aryan languages of Central India.

They consist of two great linguistic families, and are spoken by a population of not less than four millions, occupying a length of country of about four hundred miles from the District of Cuttack to Rajmahal, the boundary of Bengal and Behar. The two families are the Dravidian and Kolarian, and they are somewhat intermixed in their habitat, though perfectly distinct in appearance, customs, and language. Both lie outside of the Hindu and Aryan fold. Both are Pagan, and, if not savage in the sense of the Himalaic savages, yet fall short of the moderate type of Asiatic civilization: the language of both is agglutinating, and devoid of literature or of written character.

In the note in the report of last year a detail is given of the great Dravidian languages of Southern India, which are described as of Scythic origin, and connected with a pre-Aryan immigration from the West. Four tribes who spoke Dravidian languages are there mentioned as unimportant, two of whom will be noticed here. The Kota, a small Dravidian tribe in the Neilgherries, was incorrectly printed as Kole in last year's report: the two now to be noticed are the Gond, and Kandh, Khond, or Kho: two more are indicated as outlying members of the same family, the Uraon, and the Malers of Rajmahal. Thus we have four tribes in Central India whose language is Dravidian.

The Rev. Mr. Hurder has published a vocabulary of Rajmahali, and

Col. Ouseley, one of Uraon. Dr. Caldwell, in his *Comparative Grammar* of the Dravidian languages, has entered scientifically into the features of that family, which are well recognized: The Rev. Oscar Flex published in 1874 a good practical grammar of the Uraon language, and a considerable number of educational works have been published. A vast number of Aryan words have found their way into these languages, but the structure of the noun verb has remained intact: when it is asserted, that the syntax has been diluted to that of Hindi, we must pause, lest the argument should be round on the score of the well-known non-Aryan aspect of the di sentence-method. Two of the Gospels have been translated into Gond. The Rev. Mr. Driberg published, in 1849, a very complete grammar and vocabulary of the Mahadeo dialect of the Gond, and Dr. Mauger published an account of the dialect of the Seoni Gonds. The remarkable feature of the Gond is, that it has a system of verbal modifications and inflexions almost as elaborate as that of the Turkish, while the great Dravidian sister-languages of the south are very meagrely furnished. Dr. Caldwell imagines that this unexpected development is due to the influence of the highly-inflected Sonthali, its Kolarian neighbour, which will be noticed below. There exists a lucidly arranged grammar of the Khond, published in the Uriya character by Lingam Letchmajee, 1853: and Dr. Mauger and Sir W. Elliot have published observations on these languages in 1847, in the *Journal of the Bengal Asiatic Society*. The Uraon and Rajmahali Maler contain a large admixture of roots and forms belonging to the Kolarian language. Mr. Hodgson considers the Uraon as a connecting link between the Kolarian family and the Rajmahali; and the Rajmahali as a connecting link between the Kolarian and Dravidian.

In the Kolarian family are many tribes under varying names, but which may be reduced to three great branches. 1. The Kols or Hos. 2. The Mundaris, or Mundas, or Bhumij. 3. The Sonthals. It is the generally received opinion, that the origin of this family is from the north-east, either from the farther side of the great linguistic watershed of the Himalaya, or down the funnel of the valley of the Burhamputer. Col. Dalton thinks that he can trace their progress through Asam into the Shan districts of Siam: the immigration from the north-west of the mighty Aryan race has severed this Central Indian family from its congeners. There is an asserted linguistic resemblance between the Mundari and the Mon of Pegu in British Burmah—this is stoutly denied by others. Nothing is impossible, but

πολλὰ μετὰξὺ

• Οὐρέα τε σκίοντα, θάλασσά τε ἤχησσα.

A much more intimate knowledge of the structure of both languages is required to carry out such a connexion.

Capt. Haughton published vocabularies of some of the Kol dialects:

Capt. Tickell, in 1846, published a memorandum on the Holanguage. The Bible has been translated into Kol by the Rev. A. Nothrott. The Rev. J. Whitley, 1873, published a Mundari primer, and he asserts that any person familiar with this dialect will be understood by all Mundari-speaking people, and by the Lurka Kols. Hindi words have largely crept into use, and the struggle to retain this and the other non-Aryan idioms of a poor hilly tract may prove vain.

Two grammars have been published of the Sonthali language, one the Rev. J. Philips in 1852, and a superior one by the Rev. L. Skrefsrud, 1873. Portions of the Bible have been translated into Sonthali. There are vocabularies of other dialects; but the learned missionaries, who have a Christian flock of thousands, assert that the same language is spoken by Sonthals, Munda-Bhumij, and others of the great Kol family, all the way from Orissa to the Rajmahal Hills. In grammatical structure, Sonthali is stated to be as superior to others as Sanskrit to its cognate languages. This bold assertion we are not in a position to test. But the second assertion, that the Sonthali is among the non-Aryan languages not even second to the Turkish in grammatical structure, is borne out by the artificial and complex, yet simple and transparent, symmetry of its verb-system; for it appears to possess voice, mood, tense, gender, number, person, case, forms, and conjugations, including five voices, five moods, and twenty-three tenses, three numbers, and four cases. And though the language is unwritten, the surprising fact is stated, that the Nagari alphabet of fifty letters represents the sounds, neither more nor less, with the single redundancy of *v*, and there exist common roots for very primitive ideas in Sanskrit and Sonthali.

It is not presumed that this sketch on a subject so obscure, extending over so vast an area, is exhaustive: no amount of precision can in the present state of our knowledge be obtained: the same tribes are called by different names, and different tribes included in the same nomenclature. It is asserted by some, that such well-known tribes as the Bhils have lost their language: by others that they still preserve it: what is preserved is attributed by some to the Kolarian, by others to the Dravidian family. In Kolhapur, under the Bombay Government, it is stated that certain dialects exist, and vocabularies are given: thus a question of degree is opened up: it may be that a language is wholly Aryan, but laden with non-Aryan vocables, the legacy of its extinct predecessor: when does a language end and a dialect begin? Another still more subtle point remains: it is admitted on all hands, that in the Sanskrit vernaculars there is a large residuum of non-Aryan words, and possibly we may have here tapped the common fount of the vocables of all the languages of India.

The work of the next quarter of a century is thus cut out, and consists in reducing to the form of practical grammars the leading and most

vivacious dialect of each group, marking the dialectal variations, and then drawing up a comparative grammar of each family. Pliny mentions that there were one hundred and thirty languages spoken in the Colchian market-place; the dialects of India outside the lordly Sanskrit vernaculars can be counted by scores. The savage Nagas are said to have thirty varieties of their own, as every stream or mountain ravine causes a corresponding dialectic fissure.

Vocabularies are not wanting, but we are getting beyond that stage the inquiry. Dr. Hunter, in 1868, published one of a large number of non-Aryan languages: Col. Dalton has done the same in his *Ethnology of Bengal*: within the last year Dr. J. M. Coates has published a vocabulary of the dialects of Chota-Nagpore: Sir George Campbell, during the period of his being Lieut.-Governor of Bengal, collected and published specimens of the languages of India, with sentences of sufficient length to indicate structure of words and syntax: local vocabularies have been collected by other public servants, and notably by that illustrious linguist, Bryan Hodgson, the Resident of Nepal. In England, Latham in his *Elements of Comparative Philology* gives very brief sketches, and Max Müller, in his letter to Chevalier Bunsen, an appendix to *Philosophy of History*, treats the whole subject scientifically, and attempts classification; but his work is a quarter of a century behind date, and the author had no local knowledge. Numerous ethnical and political reports have been made on these tribes, which have been nearly a century in connexion with British India, but the chief feature of the annals of the border have been raids, and villages burnt in retaliation: our non-Aryan administration has been an unbroken failure. Within the last year Sir George Campbell collected and passed under personal review specimens of every tribe, and Col. Dalton has published photographs of nearly all.

Dr. Hunter, eight years ago, promised a comparative grammar, but the material collected is far from sufficient in quality and quantity for the construction of any sound principle of classification: many of the words entered in the vocabularies clearly are, and many more may prove to be, loan-words: the master mind is also still wanting, like the prince in the fable, to separate and group the confused heap of feathers.

And behind the linguistic question, which is the sole object of these remarks, lies the much greater one of race and religion; for the two hundred tribes, some of which we have noted, with perhaps six millions of population, are but the ethnical residuum *in situ* of the far larger portion, which has flowed down into the great crucible, and become fused into the lower strata of Hindu society all over India. There are two great fallacies which have to be dissipated—the first, that conquerors annihilate and destroy the races whom they invade and conquer: the second, that the Hindu religion is, and

ever has been, non-proselytizing. The whole history of India shows that the subject non-Aryan races were trodden down, utilized as helots, and admitted as an inferior caste into the Brahminical system: thus the subject races left their mark on the language of their conquerors; they lent words, and helped to modify syntax, but they lost their old language and identity, but preserved many of their customs and religious tenets under the veneer of a semi-Hinduism. Many tribes have retained their savage, or less civilized customs, and still lost their language, like the Bhils. Linguistically and ethnologically we have overlooked the vast residuum of non-Aryan races, and introduced little among them except a sale of fire-arms and spirits. It was a surprise that so large a proportion of the population of Lower Bengal were found in the last census to be Muhammadan: but these were non-Aryan immigrants from the eastern borders, who found Muhammadanism more to their mind, when they settled down to agriculture. Max Müller asserts broadly, that the majority of the speakers of Bengal are non-Aryan by race, and it will be our own fault, if the remainder do not find Christianity their best leader to civilization.

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The following additions have been made to the Library since the Meeting held in December last.

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August. *Peters*.—Ueber die von dem verstorbenen Prof. Dr. Reinhold Buchholz in West-Afrika gesammelten Säugethiere. Ueber die von S. M. S. Cazelle mit gebrachten Amphibien. *Duncker*.—Ueber die Zeit der Abfassung des Avesta.

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Meteorological Observations.

i

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta, •
in the month of January 1877.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	30.068	30.144	30.015	0.129	65.5	75.0	57.5	17.5
2	.075	.148	.012	.136	66.6	76.6	58.5	18.1
3	.082	.161	.039	.122	66.8	77.0	58.5	18.5
4	.088	.151	.036	.115	66.6	77.0	58.9	18.1
5	.095	.152	.051	.101	66.8	76.0	59.2	16.8
6	.115	.194	.047	.147	66.9	76.6	59.0	17.6
7	.110	.187	.063	.124	68.9	78.7	61.4	17.3
8	.112	.173	.064	.109	68.0	77.2	59.2	18.0
9	.110	.194	.037	.157	68.2	77.7	60.5	17.2
10	.075	.151	.019	.132	68.3	78.0	60.4	17.6
11	.093	.168	.034	.134	69.0	79.0	60.5	18.5
12	.094	.189	.018	.171	70.0	79.8	62.2	17.6
13	.092	.153	.029	.124	65.4	79.0	63.5	5.5
14	.110	.168	.016	.122	63.8	67.3	61.3	6.0
15	.176	.242	.131	.111	64.2	72.0	57.5	14.5
16	.219	.301	.169	.132	64.3	70.5	60.5	10.0
17	.188	.260	.136	.124	65.8	73.8	58.3	15.5
18	.171	.246	.114	.132	68.1	77.0	60.5	16.5
19	.172	.251	.124	.127	68.7	77.4	62.0	15.4
20	.118	.186	.051	.135	66.9	74.0	60.6	13.4
21	.069	.142	.017	.125	67.0	75.4	59.5	15.9
22	.067	.151	.010	.141	67.5	76.6	60.5	16.1
23	.105	.177	.049	.128	65.4	70.0	61.4	8.6
24	.134	.208	.084	.124	67.9	78.5	59.4	19.1
25	.090	.162	.015	.147	68.3	77.2	60.0	17.2
26	.047	.122	29.990	.132	68.3	76.5	60.2	16.3
27	.078	.159	30.033	.126	69.0	77.8	62.5	15.3
28	.074	.150	.019	.131	68.9	78.3	60.5	17.8
29	.015	.089	29.955	.134	70.7	79.5	62.5	17.0
30	29.966	.049	.919	.130	74.1	83.0	68.5	14.5
31	.983	.068	.908	.160	72.0	78.0	66.8	11.2

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means, are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January 1877.*

Daily Means, &c., of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued.)

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humi- dity, complete satu- ration being
	°	°	°	°	Inches.	Gr.	Gr.	
1	59.1	6.4	54.0	11.5	0.428	4.74	2.24	0.68
2	60.8	5.8	56.2	10.4	.461	5.11	.10	.71
3	61.1	5.7	56.5	10.3	.465	.15	.11	.71
4	60.9	5.7	56.3	10.3	.462	.13	.08	.71
5	60.9	5.9	56.2	10.6	.461	.10	.16	.70
6	60.6	6.3	55.6	11.3	.452	.01	.27	.69
7	61.8	7.1	56.1	12.8	.459	.06	.68	.65
8	61.3	6.7	55.9	12.1	.456	.04	.49	.67
9	61.3	6.9	55.8	12.4	.455	.03	.55	.66
10	62.4	5.9	57.7	10.6	.485	.34	.26	.70
11	63.0	6.0	58.2	10.8	.493	.43	.33	.70
12	64.1	5.9	59.4	10.6	.513	.63	.37	.70
13	64.1	1.3	63.1	2.3	.580	6.44	0.51	.93
14	62.2	1.6	60.8	3.0	.537	5.98	.63	.91
15	60.8	3.4	57.7	6.5	.485	.38	1.31	.80
16	61.1	2.3	58.2	6.1	.493	.48	.24	.82
17	62.3	3.5	59.5	6.3	.515	.71	.33	.81
18	63.8	4.3	60.4	7.7	.530	.85	.70	.78
19	63.4	5.3	59.2	9.5	.509	.62	2.07	.73
20	61.2	5.7	56.6	10.3	.467	.17	.11	.71
21	61.3	5.7	56.7	10.3	.469	.18	.12	.71
22	61.5	6.0	56.7	10.8	.469	.17	.25	.70
23	61.4	4.0	58.2	7.2	.493	.47	1.48	.79
24	62.7	5.2	58.5	9.4	.498	.50	2.01	.73
25	61.7	6.6	56.4	11.9	.464	.11	.49	.67
26	62.4	5.9	57.7	10.6	.485	.34	.26	.70
27	62.9	6.1	58.0	11.0	.489	.39	.37	.70
28	62.2	6.7	56.8	12.1	.470	.18	.56	.67
29	66.3	4.4	62.8	7.9	.574	6.31	1.87	.77
30	70.3	3.8	67.6	6.5	.672	7.34	.73	81.
31	68.8	3.2	66.2	5.8	.642	.03	.47	88.

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1877.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Falt.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	30.105	30.217	29.969	0.248	64.6	72.5	61.0	11.5
1	.096	.207	.957	.250	63.9	71.0	60.5	10.5
2	.085	.216	.947	.269	63.2	69.2	60.0	9.2
3	.077	.199	.933	.266	62.6	69.0	59.5	9.5
4	.070	.185	.936	.249	62.1	68.7	59.0	9.7
5	.081	.190	.958	.232	61.5	68.5	58.5	10.0
6	.096	.198	.990	.208	61.0	68.5	58.0	10.5
7	.116	.206	30.004	.202	60.9	68.8	57.5	11.3
8	.142	.239	.007	.232	62.5	70.0	59.0	11.0
9	.165	.277	.046	.231	66.1	71.5	62.7	8.8
10	.170	.301	.049	.252	69.1	74.5	64.0	10.5
11	.152	.288	.023	.265	71.6	77.0	64.0	13.0
Noon.	.120	.267	29.990	.277	73.3	78.6	65.2	13.4
1	.087	.223	.959	.264	74.5	80.0	65.5	14.5
2	.063	.193	.930	.263	75.5	81.0	65.2	15.8
3	.048	.169	.917	.252	75.8	83.0	64.9	18.1
4	.043	.176	.908	.268	74.7	82.0	64.0	18.0
5	.050	.169	.919	.250	73.6	80.8	64.0	16.8
6	.061	.187	.931	.256	71.1	78.8	64.0	14.8
7	.075	.205	.934	.271	69.1	76.0	61.0	12.0
8	.092	.227	.963	.264	68.2	71.6	63.0	11.6
9	.103	.250	.958	.292	67.1	73.5	62.5	11.0
10	.109	.252	.960	.292	66.2	72.5	62.2	10.3
11	.107	.232	.951	.281	65.5	72.0	61.3	10.7

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means, are derived from the observations made at the several hours during the month.

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taken at the Surveyor General's Office, Calcutta,
in the month of January 1877.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity
	°	°	°	°	Inches.	Gr.	Gr.	
Mid-night.	61.7	2.9	59.4	5.2	0.513	5.70	1.08	0.84
1	61.1	2.8	58.6	5.3	.499	.56	.07	.84
2	60.6	2.6	58.3	4.9	.494	.50	0.99	.85
3	60.1	2.5	57.8	4.8	.486	.43	.94	.85
4	59.6	2.5	57.3	4.8	.478	.34	.93	.85
5	59.3	2.2	57.3	4.2	.478	.35	.81	.87
6	59.0	2.0	57.2	3.8	.476	.33	.73	.88
7	58.8	2.1	56.9	4.0	.472	.28	.76	.87
8	60.2	2.3	58.1	4.4	.491	.49	.86	.87
9	62.1	4.0	58.9	7.2	.504	.59	1.51	.79
10	63.2	5.9	58.5	10.6	.498	.48	2.30	.70
12	64.0	7.6	57.9	13.7	.488	.34	3.06	.64
1	64.4	8.9	57.3	16.9	.478	.22	.62	.59
2	61.7	9.8	57.8	16.7	.486	.29	.89	.58
3	65.1	10.4	57.8	17.7	.486	.28	4.18	.56
4	65.1	10.7	57.6	18.2	.483	.24	.30	.55
5	64.4	10.3	57.2	17.5	.476	.18	.06	.56
6	64.9	8.7	58.8	14.8	.503	.48	3.45	.61
7	64.7	6.4	59.6	11.5	.516	.66	2.62	.68
8	64.5	4.9	60.6	8.8	.534	.87	1.99	.75
9	63.9	4.3	60.5	7.7	.532	.87	.71	.77
10	63.3	3.8	60.3	6.8	.528	.85	.47	.80
11	62.8	3.4	60.1	6.1	.525	.82	.30	.82
12	62.5	3.0	60.1	5.4	.525	.83	.15	.84

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January 1877.*

Solar Radiation, Weather, &c.

	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	WIND.			General aspect of the Sky.
			Prevailing direction.	Max. Pressure	Daily Velocity.	
	^o	inches.		lb.	Miles.	
1	123.0	...	N N W & N	...	121.5	B to 11 A. M., \i to 3, B to 11 P. M.
2	127.5	...	N & N N E	...	112.0	B. Foggy at 9 P. M.
3	107.5	...	S & S by W	...	48.0	B.
4	128.0	...	S by E & S S W	...	68.4	B to 7 A. M., \i to 12, \ to 5, B to 11 P. M.
5	127.5	...	S by W & W S W	...	43.6	B to 11 A. M., \i to 5, B to 11 P. M. Slightly foggy from 8 to 11 P. M.
6	123.0	...	W S W & N by E	...	82.0	B. Foggy at midnight.
7	127.8	...	N by E & N	...	71.3	B to 1, \i to 3, B to 11 P. M.
8	114.8	...	N & W by N	...	88.3	B to 2, \i to 5, B to 11 P. M.
9	...	...	W by N & N	...	101.5	B.
10	...	...	N & S S W	...	48.5	B. Slightly foggy at 5 & 6 A. M. & 8 & 9 P. M.
11	...	...	S S W & E	...	31.8	B to 3, \i to 5, B to 11 P. M.
12	...	0.06	S by E & S	...	73.7	B to 4 A. M., \i to 3, \i to 3, O to 11 P. M. Light R at 7 & 11 P. M.
13	Out of order	1.94	S E	...	143.2	O. T at 10½ A. M. R from Midnight to 4 P. M.
14	...	...	...	...	174.6	O to 5, B to 11 P. M. D at 7, 10 & 11 A. M.
15	...	...	N by E	...	141.3	B to 6 A. M., \i to 7, B to 11 P. M. Slightly foggy at 8 & 9 P. M.
16	...	0.03	N by E & N E	...	191.2	B to 1, \i to 4, O to 10 A. M., \i to 3, \i to 5, B to 11 P. M. Slightly foggy at 7 & 8 P. M. Light R at 6 & 10½ A. M.
17	...	...	N N W N by E, N W &	...	79.1	B to 7 A. M., \i to 3, \i to 6, B to 11 P. M. Foggy from 5 to 7 A. M.
18	128.3	...	N N W & N	...	79.3	B to 4 A. M., \i & \i to 5, B to 11 P. M. Slightly foggy from 8 to 11 P. M.

\i Cirri, —i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi,
\i Cirro-cumuli, B clear, S straton, O overcast, T thunder, L lightning,
R. rain, D. drizzle.

*Abstract of the Results of the Hourly Meteorological Observations
 taken at the Surveyor General's Office, Calcutta,
 in the month of January 1877.*

Solar Radiation, Weather, &c.

	Max. Solar radiation	Rain Gauge $\frac{1}{8}$ ft. above Ground.	WIND.		General aspect of the Sky.
			Prevailing direction.	Max. Pressure Daily Velocity.	
		Inches.		Miles.	
19.	129.0		N & N by W	69.0	B to 9 A. M., \i to 5, B to 11 P. M. Slightly foggy at Midnight & 1 A. M.
20	129.7		N & N W	108.5	B to 6 A. M., \i & \i to 3, O to 11 P. M.
21	127.8		N W	130.3	\i to 7 A. M., B to 2, \i to 11 P. M. Slightly foggy at 10 & 11 P. M.
22	127.7		N N E & N E	112.3	\i to 1, B to 5 A. M., \i to 11 P. M.
23			N W & W by S	103.9	S to 7, \i to 9 A. M., O to 7, \i to 11 P. M. Slightly foggy from 8 to 11 P. M. D at 10, 11 A. M. & 12 P. M.
24	129.5		W by S & N E	58.9	B. Slightly foggy from Midnight to 2 A. M. & at 7 P. M.
25	129.0		N E, N N W & N N E	118.2	B. Slightly foggy at 10 & 11 P. M.
26	126.5		N N E, N W & W	102.7	B to 6, \i to 8 A. M., \i to 4, \i to 6, O to 9, \i to 11 P. M. Slightly foggy at Midnight, 1 A. M. & 11 P. M.
27	131.0		W by N & W	60.4	\i to 3 A. M., B to 6, \i to 11 P. M. Slightly foggy at Midnight & from 8 to 11 P. M.
28	131.0		W & W by S	67.9	\i to 11 A. M., \i to 7, B to 11 P. M. Slightly foggy at Midnight & 1 A. M.
29	136.0		W by S & S W	48.4	\i & \i to 9 A. M., \i to 1, \i to 4, \i to 9, B to 11 P. M.
30	138.0		S W & S S W	71.3	B to 6, \i to 9, \i to 11 A. M., \i to 5, \i to 7, \i to 9, O to 11 P. M. Slightly foggy from 4 to 8 A. M. T, L & R at 11 $\frac{1}{2}$ P. M.
31	134.5	0.87	S W & S S W	0.3 87.6	O to 40 A. M., \i to 12, \i to 4, \i to 8, \i to 11 P. M. T & L at Midnight & 1 A. M. R from Midnight to 5 $\frac{1}{2}$ A. M.

\i Cirri, —i Strati, \i Cumuli, \i Cirro-strati, ~i Cumulo-strati, \i Nimbi, \i Cirro-cumuli, B clear, S straton, O overcast, T thunder, L lightning, R. rain, D. drizzle.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of January 1877.*

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	30.086
<i>ax.</i> height of the Barometer occurred at 10 A. M. on the 16th	30.301
<i>in.</i> height of the Barometer occurred at 4 P. M. on the 31st	29.908
<i>Extreme range</i> of the Barometer during the month ...	0.393
Mean of the daily Max. Pressures	30.171
Ditto ditto Min. ditto	30.040
Mean daily range of the Barometer during the month ...	0.131

Mean Dry Bulb Thermometer for the month	67.7
Max. Temperature occurred at 3 P. M. on the 30th	83.0
Min. Temperature occurred at 7 A. M. on the 1st & 15th	57.5
<i>Extreme range</i> of the Temperature during the month	25.5
Mean of the daily Max. Temperature	76.1
Ditto ditto Min. ditto,	60.7
Mean daily range of the Temperature during the month	15.4

Mean Wet Bulb Thermometer for the month	62.5
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	5.2
Computed Mean Dew-point for the month	58.3
Mean Dry Bulb Thermometer above computed mean Dew-point	9.4

	Inches.
Mean Elastic force of Vapour for the month	0.494

	Grain.
Mean Weight of Vapour for the month	5.46
Additional Weight of Vapour required for complete saturation ...	2.00
Mean degree of humidity for the month, complete saturation being unity	0.73

Mean Max. Solar radiation Thermometer for the month	128.4
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	Inches.
Rained 7 days;—Max. fall of rain during 24 hours	1.94
Total amount of rain during the month	2.90
Total amount of rain indicated by the Gauge* attached to the anemo- meter during the month	out of order
Prevailing direction of the Wind	N & N W

* Height 70 feet 10 inches above ground.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR FEBRUARY, 1877.

The Annual Meeting of the Asiatic Society was held on Wednesday the 7th February, 1877, at 9 o'clock P. M.

COL. H. L. THULLIER, C. S. I., Vice-President, in the Chair.

According to the Bye-Laws of the Society, the Chairman ordered the voting papers to be distributed for the election of Officers and Members of Council for 1877, and appointed Dr. Cayley and Mr. Waldie Scrutineers.

The CHAIRMAN then called upon the Secretary to read the Annual Report.

ANNUAL REPORT FOR 1876.

The Council of the Asiatic Society in submitting the Annual Report for 1876, have the satisfaction of exhibiting an unprecedentedly prosperous state of the Society's affairs. The year just passed has been one of the most eventful and important in the history of the Society, and it is to be hoped will mark a new era in its progress.

Under an agreement made with Government, the Council, on behalf of the Society, accepted the sum of Rs. 1,50,000 in lieu of the rooms originally assigned to the Society in the New Museum Building, and on completion of the negotiations, arrangements were made for the immediate removal of the Society's Collections to the New Museum. The Society's house is therefore now free from the Museum collections, and for the first time for many years the whole space is available for the more immediate purposes of the Society. This will enable the Council to assign proper space to the Library, and to make for the comfort of Members other arrangements that have hitherto been impossible. The house has been put in a state of thorough repair, and many improvements have been effected, and the Council feel assured that the arrangement under which the Society remains independent and in possession of their own building will be greatly to the

advantage of the Society, especially as they now possess one of the finest suites of rooms in Calcutta for their meetings, whilst the remaining space in the house is better adapted to the requirements of the Society, and the increasing stock of its publications, than the rooms in the New Museum ever could have been.

At the close of the year 1876, there were 347 Ordinary Members on the rolls of the Society, of whom 51 were in Europe. Of these Members, in Europe 48 are non-subscribing Members, leaving a balance of 299 actual paying Members, of whom 119 are Resident, 175 non-Resident and 5 L. Members.

During the year under review, there has been an accession of 31 new Members, against 28 in the previous year, while the Society was deprived of 17 Ordinary Members by resignation, and 6 by death, making a loss of 23, and leaving a total number of Ordinary Members at the close of the year, 347 against 315 at the close of 1875.

The following is a tabular statement showing the fluctuations in the number of Members during the last ten years.

Year.	Paying.			Absent.	Total.
		Resident.	Non-Resident.	Non-paying.	
1867	307	154	153	109	416
1868	294	159	135	133	427
1869	304	162	142	138	442
1870	266	134	132	148	414
1871	286	112	174	160	446
1872	279	105	172+2 L.M.	169	438
1873	305	116	186+3 L.M.	63	358
1874	312	127	184+3 L.M.	32	346
1875	295	113	179+3 L.M.	50	345
1876	299	119	175+5 L.M.	48	347

Dr. Werner Siemens, Berlin, and Colonel Henry Yule, R. E., C. B. were in the past year elected Honorary Members.

Of the Ordinary Members the Council have to regret the decease of Mr. W. S. Atkinson, Dr. R. Brown, Captain J. Butler, Mr. W. L. Heeley, C. S., The Right Revd. Dr. R. Milman, Lord Bishop of Calcutta, and Mr. W. G. Willson. Captain Butler contributed several valuable papers to the Journal on the hill tribes of Eastern Assam and their languages; he died on the 7th January last from the effects of a spear-wound received while on political duty in the Nágá Hills. Mr. W. S. Atkinson was an accomplished entomologist, and had been for several years a Secretary of the Society, and a Society's Trustee of the Indian Museum. He died at Rome.

on the 15th January. Mr. Heeley also had been for some time a Secretary of the Society and a Member of the Council and Philological Committee.

Of the Honorary Members—Prof. Jules Mohl, Memb. de l'Institut, Paris, and Prof. Christian Lassen, Bonn. A short account of the life and labours of Prof. Lassen, who had been an Honorary Member since 1831, was given in the June number of the Proceedings. Mr. Mohl, an oriental scholar of the highest reputation, was elected an Honorary Member in 1843, and was especially known for his critical edition of Firdausi's *Sháh-námah*, to which he devoted the last forty years of his life.

Of the corresponding members, Dr. M. Haug of Munich and M. F. H. Foucaux of Paris.

Indian Museum.

The Council continue to carry out the provisions of Act XXII of 1876, Act XVII. of 1866 having been repealed, and to transfer all Natural History and Archaeological specimens received by them to the Trustees of the Indian Museum. During 1876 the following specimens presented to the Society were transferred to the Museum:

1. Two pieces of Meteorite received from the Agra Archaeological Society.

2. A collection of Archaeological remains from Maldah.

3. A specimen of a Glass-sponge (*Hyalonema Sieboldii*).

The vacancies among the Trustees on the part of the Society, occasioned by the retirement of Dr. Oldham, Col. Hyde, Col. Gastrell, and Dr. S. B. Partridge, have been filled up by The Hon. Sir E. C. Bayley, K. C. S. I., Dr. T. R. Lewis, Captain J. Waterhouse, and Mr. H. Blochmann.

According to the provisions of the new Act, the number of Society's Trustees has been increased from four to five. A new Trustee will shortly be nominated.

Finance.

The sum received from Government in lieu of the accommodation in the New Museum has ensured the permanent financial prosperity of the Society, by giving it a certain and assured income in addition to the subscriptions of Members. Under the new rules a large portion of this sum, *viz.*, Rs. 1,20,000 has been set aside as a Permanent Reserve Fund, which is to be increased yearly by the addition of the admission and compounding fees of Members. This Permanent Reserve Fund is not to be drawn upon except on very special occasions and with the full consent of the general body of Members. In course of time the income derived from this fund will enable the Society to take an active and prominent part in encouraging Oriental Studies, and stimulating the progress of research in

the Natural and Physical Sciences in this country : but before taking any definite steps in this direction, the Council consider it essential that this Permanent Reserve Fund shall be brought up to at least Rs. 1,50,000, so as to give the Society an income of not less than Rs. 6,000 per annum, independently of subscriptions. How far the Council will be able to do this at once will depend on the amount to be spent in repairs and fitting up the Society's Rooms.

As regards the present financial condition of the Society, the Council have the pleasure to report that the Assets of the Society at the close of 1876 consisted of :—

Government Securities,	Rs.	1,53,000	0	0
Balance in Bank of Bengal,	"	3,749	10	9
Cash in hand,	"	218	6	3

Rs. 1,56,968 1 0

of which Rs. 1,53,000 are actually invested in Government Securities, Rs. 5,000 of Government paper having been sold to meet the expenses of the repairs of the house. A farther sum of Rs. 19,000 has yet to be paid on account of repairs, furniture, &c., but the Council fully expect that when all expenses have been paid connected with the repairs and refitting of the Society's rooms, there will remain the sum of Rs. 1,38,000 to the credit of the Society.

The total subscriptions realized from Members amounted during the year under review to Rs. 9,009, which is less by Rs. 751 than the total subscriptions collected during the previous year. The outstandings of the Society up to the 31st December 1876, amount to the large sum of Rs. 6,270. The arrears due to the Society at the end of 1875 were Rs. 6,561, upon which amount the slight reduction of Rs. 291 has been effected. The Council would urge upon Members the importance of punctual payment of their subscriptions. The expenditure on account of repairs, &c., during 1877 will be heavy ; and the early paying up of all arrears would render it to a great extent unnecessary to touch the vested capital of the Society.

The following is a statement of the receipts and disbursements of the Society during the year :

RECEIPTS.

1875.

Subscriptions,	Rs.	9,760	15	0
Admission Fees,	"	930	0	0
Publications,	"	1,729	10	0
Library,	"	411	14	0
Secretary's Office,	"	24	15	6
Vested Funds,	"	449	0	0
Building,	"	4,800	0	0

Coin Fund,	Rs.	0	0	0
Sundries,	...	3,657	0	1
		<hr/>		
	Rs.	21,763	6	7
		<hr/>		

1876.

Subscriptions, ...	Rs.	9,009	1	9
Admission Fees, ...	...	800	0	0
Publications, ...	...	1,535	8	0
Library, ...	...	312	9	6
Fines and Commissions, ...	...	60	8	3
Received from Government, ...	...	1,50,000	0	0
Interest on Vested Funds, ...	...	13,675	14	8
Rent from Government, ...	...	1,920	0	0
Postage and Miscellaneous, ...	...	5,676	3	0
		<hr/>		
	Rs.	1,82,989	13	2
Balance in the Bank of Bengal, ...	...	3,858	2	3
Cash in hand, ...	...	160	9	4
		<hr/>		
Total,	Rs.	1,87,008	8	9
		<hr/>		

DISBURSEMENTS.

1875.

Publications, ...	Rs.	7,373	2	1
Library, ...	...	4,475	6	6
Secretary's Office, ...	...	3,769	9	9
Vested Funds, ...	...	4,073	9	8
Building, ...	...	1,008	12	7
Coin Fund, ...	...	376	4	0
Sundries, ...	...	3,686	3	8
		<hr/>		
	Rs.	24,763	0	3
		<hr/>		

1876.

Publications, ...	Rs.	8,893	14	6
Library, ...	...	3,161	7	7
Establishment and petty charges, ..	...	5,937	6	0
Government Securities purchased, ..	...	1,44,800	0	0
Premium and Commission, ..	...	6,162	0	10
Building Repairs,	9,247	7	6

Taxes,	Rs.	792	0	0
Coin Fund,	81	13	0
Postage and Miscellaneous,	3,964	6	4
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	Rs.	1,83,040	7	9
Balance in the Bank of Bengal,	3,749	10	9
Cash in hand,	218	6	3
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Total, Rs. 1,87,008 8 9				

The following is the estimate for Income and Expenditure for 1877.

INCOME.

Subscriptions,	Rs.	7,500	0	0
Admission Fees, ... ..	...	800	0	0
Publications, ... ..	...	1,500	0	0
Library, ... ..	...	300	0	0
Interest on Vested Funds, ...	...	8,000	0	0
Postage, &c., refunded, ...	...	4,000	0	0
<hr/>				
	Rs.	22,100	0	0

EXPENDITURE.

Publications,	Rs.	8,400	0	0
Establishment, ... ..	...	6,000	0	0
Building Repairs, ... ..	...	0,000	0	0
Coin Fund,	500	0	0
Library,	2,000	0	0
• Postages, &c.,	4,000	0	0
Taxes,	800	0	0
Balance,	400	0	0
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	Rs.	22,100	0	0

The London Agency.

The last statement of accounts received from Messrs. Trübner and Co. the Society's London Agents, dates from the 1st July, 1875, to the 30th June, 1876. A balance of £15-14-6 was found to be due to Messrs. Trübner, which was remitted on the 8th December, 1876.

Within the above-mentioned period the sale of the Society's Journal and Proceedings, as shown in the accounts submitted, realized Rs. 679-8,

and the publications of the Bib. Indica, Rs. 860-15, making a total of Rs. 1,540-7, which sum amounting, at an exchange of 1s. 8d. to the rupee to £128-7-4½, was placed to the credit of the Society.

During the same time the Society forwarded to Messrs. Trübner by different invoices, for sale, 218 copies of both parts of the Journal and 168 copies of the Proceedings, valued at £49-1; and of the Bib. Indica publications 439 copies worth £32.

The Invoices received from Messrs. Trübner, comprising the publications of scientific Societies presented to, and subscribed for, by the Society, books to order, and books on inspection amounted to £149-12-7. From this sum £12-4-6 has to be deducted, as it represents the value of books sent out on inspection, which were declined by the Library Committee and returned to Messrs. Trübner. The next statement of accounts will be received from the Agents about August, and will show the business transacted up to the end of June of 1877.

Library.

During the year the additions to the Library comprised 1048 Vols. and parts of vols, of which 360 were obtained by purchase and 688 by presentation from the Government, from authors, and by exchange.

The Council regret that in consequence of the disorder caused by the removal of the Library for the repairs, it has not been possible to make any progress with the compilation of the new Catalogue. The Council however bear the subject closely in mind, and steps will be taken for immediately proceeding with this important work, as soon as circumstances will permit.

Arrangements will be made with the Society's London Agents and with local booksellers for the early supply of the latest standard works relating specially to India and the East, as well as for those of general scientific interest.

A furnished reading room has been provided for the use of members.

The Photographic Collection of the Society has only received two donations this year, consisting of a collection of photographs found among the effects of the late Dr. Stoliczka, and a set of photographs of the paintings at the Adjunta Caves in the Bombay Presidency, presented by the Government of India.

Five years ago the Council appointed a Pandit to prepare an ana-

*Names.	No. of MSS.	lytical catalogue of the Sanskrit
Grammar,	85	MSS. in the Society's Library, and
Dictionaries,	10	considerable progress has been made
Koshas,	30	in the work. Upwards of eleven
Tantras,	108	hundred codices have been analyzed
Purānas,	115	and described in Sanskrit, as per
Medical Works,	40	memo on the margin.* A descrip-
Smṛiti,	185	
Jyotisha,	120	

Chhandus,	6	tive account in English of all the
Alankasa,	15	MSS. on grammar has also been printed under the superintendence of Dr.
Sāṅkhya,	10	
Pāṅgala,	5	
Maimansā,	35	Rājendralāla Mitra, and a fasciculus of about 180 pages will be published in a short time. The other portions await translation into English before they can be sent to press.
Nyāya,	54	
Rāmāyana,	15	
Vedānta,	72	
Kāvya,	125	
Miscellaneous of recent Collections,	80	
MSS. 1110		

During the past year the Pandit prepared notices of 173 MSS.

Dr. Rājendralāla Mitra has lately undertaken to prepare a catalogue *raisonné* of the collection of Buddhist MSS. from Nepal which Mr. B. H. Hodgson presented to the Society some years ago. The task is a difficult and extremely troublesome one, as it involves the necessity of reading a large mass of MSS., some of which are in the Gāthā dialect or corrupt Sanskrit, and written, for the most part, in the little-known Newāri character; but it is expected that with the aid of two Pandits who are now working under him, Dr. Mitra, will be able, in course of the current year, to bring to light the contents of this rare and valuable collection.

Maulawī 'Abdul-Haī Kātib, under the superintendence of Mr. Blochmann, has begun to check the Arabic, Persian, and Urdū MSS., and prepare a new complete catalogue, which is urgently wanted.

Revised Rules.

During the year a revised edition of the Rules has been issued comprising several important additions, the principal of which are: the giving to the Council the power of electing Members during the Recess; the reduction of the Resident subscriptions from Rs. 12 to Rs. 9 per quarter, and the introduction of rules for the composition of subscriptions both by non-resident and resident Members. A rule for compounding subscriptions had long been required, but could not be introduced until the financial condition of the Society fully warranted it. The rules regarding the retention of Membership during absence from India and on leaving India permanently have also been remodelled, and the home subscription has been increased from Rs. 12 to Rs. 16 as it was found that the former rate was quite insufficient to meet the expenses incurred by the Society in supplying the Journal to absent Members with the cost of carriage to Europe. New rules have also been added regarding the disposal and custody of the Society's Funds. The Council have to acknowledge the assistance rendered in this matter by the Sub-Committee, comprising Messrs. W. T. Blanford, R. Taylor, J. O'Kinealy and the Secretaries.

Publications.

During 1876 the Society has issued 10 Numbers of the Proceedings, which together with the Meteorological Observations amount to 333 pages of letter press, illustrated by 3 plates.

Of the Journal, Pt. I, three Nos. have been issued containing 403 pages of letter-press with 7 plates. Of Journal Pt. II, 3 Nos. have been published consisting of 190 pages of letter-press illustrated by 14 plates.

The stock of the Society's publications, as also that of the Bibliotheca Indica, have been arranged on the ground-floor of the building.

Coin Cabinet.

The Coin Cabinet of the Society has, during 1876, acquired by presentations 4 gold, 3 silver, and 11 copper coins, and 6 silver coins by purchase. Of the gold coins the Society are indebted to Mr. Bourne for two, and to Dr. J. Scully for two. Of the silver and copper coins, Dr. Scully presented 3 silver and 9 copper, and Dr. Oldham 2 copper.

Repairs and Alterations.

As already reported to the Society, the Society's Rooms have been thoroughly repaired and several alterations and improvements effected.

The old Portico has been replaced by a new and more convenient one. The entrance into the house has been improved by the addition of a new door. A retiring room and a lavatory, have been fitted up on the ground floor. In lieu of the old wooden railing to the staircase, a new iron railing has been put up, and the staircase hall has been much improved by the enlargement of the skylight. The Meeting Room and other rooms round it have been coloured and ornamented, and the whole suite of public rooms, staircase, and approaches, have been lighted with gas.

In the Compound a new range of servants' houses has been built, and a handsome railing will be put up immediately along the Park Street front of the premises. That these alterations are a great improvement upon the old state of things there can be no doubt, and the Council have every reason to believe that they are regarded with satisfaction by the Members of the Society, who have seen them.

The amount spent up to 31st December, 1876 on account of repairs has been Rs. 9,200-0-0.

Pictures.

The collection of pictures in the possession of the Society has long been in a very bad state, and though a few of the worst were done up in 1874, the majority required a thorough cleaning. The whole collection has accordingly been placed in the hands of Mr. G. G. Palmer of the Surveyor General's Office to be cleaned and restored. Mr. Palmer has executed his task in a most satisfactory manner and has wonderfully improved the appearance of some of the pictures. The opportunity has also been taken of having all the frames repaired and re-gilt.

The expenditure on this account has been-

For the pictures,	Rs. 1,000 0 0
„ frames, ... ..	... 1,561 5 6
	<hr/>
	Rs. 2,561 5 6

Registration of the Society.

As it was considered desirable that the Society should have a definite legal status, it has been duly registered under the Literary Society's Act (XXI of 1860), and a rule has been introduced giving the Council power to take proceedings under the Act for the recovery of debts due to the Society, though it is hoped that the necessity will never arise for any such extreme measures.

Secretary's Office.

Throughout the year 1876, the duties of Philological and Natural History Secretary, and the editing the respective Parts of the Journal have been discharged by Messrs. Blochmann and Wood-Mason. The General Secretaryship has been retained by Capt. Waterhouse. In June Col. Gastrell having resigned the Treasurership, consequent on his retirement from India, Mr. H. B. Medlicott, Superintendent, Geological Survey, took charge and, with the exception of the months of August, September, and October, during which time Capt. Waterhouse acted, has continued to perform the duties of that office.

The Council have reason to be satisfied with the zeal and energy shown by Mr. Leonard the Assistant Secretary during the year, and he promises, with more experience, to be a valuable servant of the Society. Babu Money Lal Bysack, who had served the Society for upwards of 24 years as Assistant Librarian, died in February last, and the Society have lost in him a faithful servant. Babu Judo Bindo Bysack, his son, has been engaged as Store-keeper and promises fairly. Babu Buddinath Bysack, the Cashier of the Society, having resigned in consequence of old age and increasing infirmities, his son Kedernath Bysack has been appointed in his place, and with occasional assistance from his father is carrying on the duties of his office.

Bibliotheca Indica.

Sanskrit Series.

The editors of the Sanskrit Series continue their labours with unabated zeal, and considerable progress has been made in bringing the larger works of the Series towards completion. Altogether nineteen fasciculi have been published, comprising portions of seven different works.

The *Saṁhitās* of the Sama Veda owe their distinctive character to a

large mass of accents, prosodial marks, and musical notes, and the necessity of supplying those marks and notes above and below the lines of the text, as usual in old MSS., has entailed enormous labour, and greatly swelled the bulk of the work. The third volume, completed during the year, has brought up the work to the third book of the second part, and two volumes more, or about fifteen fasciuli, will bring the work to a completion. The MSS. used all belong to the North Indian recension, with prosodial marks differing in some respects from what are current in Southern India, but the principal peculiarity being the use of figures instead of letters to indicate the notes of the gamut it is not of much importance.

The fourth volume of the *Chaturvarga Chintāmani* is devoted to optional fasts and penances, which disclose an interesting picture of the state of Hindu society at the time when it was compiled, and for some time previously. The work, besides, is replete with quotations from ancient authors, which are of great value, in connexion with the history of the canonical literature of the country. Seven fasciuli of the work have been printed, and six more will complete the volume.

Dr. Rājendralāla Mitrā has brought to conclusion his edition of the *Aitareya Aranyaka* of the Rig Veda with the commentary of Sūrya Achārya. The work was undertaken at the suggestion of Professor Max Müller, and it has been completed with the aid of six MSS., one of which was obtained from Dr. Burnell of Mangalore, another from Dr. Bühler of Guzerat, and four from Benares. The texts from Madras and Bombay, it appears, do not differ at all from the North Indian recension. The editor has supplied an abstract, in English, of the contents of the work, and a full account of the materials which he had at command in carrying the work through the press.

Of Vāchaspati Miśra's Gloss on Śaṅkara's Commentary on the *Vedānta Sūtras*, two fasciuli have been published during the year under report. It is expected the work will be completed in course of the current year.

Owing to the want of reliable materials the progress of the Society's edition of the Commentary on the *Nītisāra* of Kāmandaki had been for some time very much impeded. The want, however, has lately been supplied. During a recent tour in the North Western Provinces in search of Sanskrit MSS., Dr. Rājendralāla Mitra procured a complete and very correct MS. of that work, and with its aid, the editor, Paṇḍit Jagamohana Tarkālankāra, will, it is expected, be able to complete the edition in course of the current year. Only one fasciculus of the work was printed during the past year.

Paṇḍit Chandrakānta Tarkālankāra continues his labours on the *Grihya Sūtras* of Gobhila. The commentary on it has been compiled by the Paṇḍit with the aid of two defective MSS. and the glosses on the

Snána, the Sandhyá and the Parísíshta Sútras of which he possesses some excellent MSS. The work will prove of great value in explaining the domestic rites of the followers of the Sáma Veda.

The Society's edition of the Sañhitá of the Black Yajur Veda, which was originally undertaken by the late Dr. Roer, and subsequently taken in hand by Dr. Cowell, is now being carried through the press by Professor Mahesachandra Nyáyaratna of the Calcutta Sanskrit College. The work is of large extent, and it will take three or four years yet before it can be completed. Only one fasciculus was printed during the past year.

Arabic and Persian Series.

In the Arabic and Persian Series, eight fasciculi were issued during the year.

Of the *Iqábah*, or 'Biographical Dictionary of Persons that knew Muhammad', by Ibn Hajar, Maulawí 'Abdul Hai, Head-Professor of the Calcutta Madrasah, has issued Fasc. XIV and XV of Vol. II. A complete MS. of *Iqábah* was kindly lent to the Society by Nawáb Sayyid Siddiq Hasan Khán of Bhopál, and another MS. of the missing Vols. II and III was obtained from Maulawí Kabiruddín. Maulawí 'Abdul-Hai, in October last, went on a pilgrimage to Mecca, where he expects to examine the MS. of the *Iqábah* preserved there.

Major Raverty has issued two fasciculi, Nos. VII and VIII, of his annotated English Translation of the *Tabaqât-i-Naqirí*.

Mr. Blochmann has issued two 4to. fasciculi, Nos. XVIII and XIX, of the Persian text of the *Aín-i-Akbarí*. Not quite two fasciculi more will complete the work.

Maulawí 'Abd-urrahím of the Calcutta Madrasah has issued two 4to. fasciculi of Abul-Fazl's *Akbarnámah*, Vol. II.

' The following is a detailed list of the publications during 1876—

Sanskrit.

' CHATURVARGA CHINTÁMANI, by Hemádri, edited by Paṇḍit Bharata-chandra Sīromani. Nos. 331, 341, 344, 354, Vol. II, Fasc. III to VI.

' SÁMA VEDA SAÑHITÁ, with the commentary of Sáyaṇa Achárya, edited by Paṇḍit Satyavata Sámasrami, No. 334, Vol. II, Fasc. VI. Nos. 339, 340, 342, 347, 348, 351, 355, Vol. III, Fasc. I to VII.

' AITAREYA ARANYAKA of the RIG VEDA with the commentary of Sáyaṇa Achárya, edited by Rájendralála Mitra. Nos. 335, 337, 345, Fasc. III to V.

' BRÁMATÍ, a gloss on S'añkara Achárya's commentary on the BRAHMA SÚTRAS, by Váschaspati Mísra, edited by Paṇḍit Bála Sástrí. Nos. 336, 343, Vol. I Fasc. II and III.

NÍTISÁRA, or the Elements of Polity, by Kámandaki with a commentary, edited by Jaganmohana Tarkálankára. No. 338, Fasc. IV.

GOBHILÍYA GRÍHYA SÚTRA, with a commentary by the editor, edited by Chandrakánta Tarkálankára. No. 346, Fasc. VI.

SAÑHITÁ OF THE BLACK YAJUR VEDA, edited by Dr. E. Roer, F. B. Cowell, M. A., and Maheshachandra Nyáyaratna. No. 236, O. S. Fasc. XXIX.

Arabic and Persian.

TABAQÁT-I-NÁSIRÍ of Minháj-i-Siráj, translated into English by Major H. G. Raverty. Nos. 331 and 333, Vol. I, Fasc. VII and VIII.

AÍN-I-AKBARÍ, by Abul-Fazl-i-Mubárah-i-'Allámí, edited by H. Blochmann, M. A., Nos. 349, 350, Vol. II, Fasc. XVIII, XIX.

THE AKBARNÁMAH, by Abul-Fazl-i-Mubárah-i-'Allámí, edited by Maulawí 'Abd-urrahím. Nos. 352, 353, Vol. II, Fasc. I.

IÇÁBAH, or BIOGRAPHICAL DICTIONARY OF PERSONS WHO KNEW MUHAMMAD, by Ibn Hajar, edited by Maulawí 'Abd-ul-Hai. Old Series, Nos. 234, 235, Vol. II, Fasc. XIV, XV.

List of Societies and Institutions with which Exchanges of Publications have been made during 1876.

Agra :—Agra Asiatic Society.

Batavia :—Batavian Society of Arts and Sciences.

Belgium :—Geological Society of Belgium.

Birmingham :—Institution of Mechanical Engineers.

Bombay :—Branch Royal Asiatic Society.

„ :—Editor, Indian Antiquary.

Boston :—Natural History Society.

Bordeaux :—Bordeaux Academy.

Buenos Ayres :—Public Museum.

Brussels :—Royal Academy of Sciences.

Cherbourg :—National Society of Natural Science.

Calcutta :—Agricultural and Horticultural Society of India.

———— :—Geological Survey of India.

Christiania :—University.

Copenhagen :—Royal Society of Northern Antiquaries.

Cambridge :—University.

California :—California Academy of Arts and Sciences.

Dacca :—Editor, Bengal Times.

Dehra Dún :—Great Trigonometrical Survey.

Dublin :—Royal Irish Academy.

———— :—Natural History Society.

Edinburgh :—Royal Society.

- Frankfort :—Natural History Society.
 Geneva :—Physical and Natural History Society.
 Genoa :—Museum of Natural History.
 Königsberg :—Physical and Economical Institution.
 Lahore :—Agricultural Society of the Pánjab.
 Leipzig :—German Oriental Society.
 Liège :—Royal Society of Sciences.
 Leyden :—Royal Herbarium.
 Liverpool :—Literary and Philosophical Society.
 London :—Royal Society.
 ——— :—British Museum.
 ——— :—Royal Asiatic Society of Great Britain and Ireland.
 ——— :—Royal Institution.
 ——— :—London Institution of Civil Engineers.
 ——— :—Royal Geographical Society.
 ——— :—Museum of Practical Geology.
 ——— :—Zoological Society.
 ——— :—Statistical Society.
 ——— :—Geological Society.
 ——— :—Linnean Society.
 ——— :—Anthropological Institute.
 ——— :—Royal Astronomical Society.
 ——— :—Editor, Athenæum.
 ——— :—Editor, Geographical Magazine.
 ——— :—Editor, Nature.
 Lyon :—Agricultural Society.
 Moscow :—Society of Naturalists.
 Madras :—Government Central Museum.
 ——— :—Literary Society.
 Manchester :—Literary and Philosophical Society.
 Munich :—Royal Academy.
 Netherlands :—Royal Society.
 New Haven :—Connecticut Academy of Arts and Sciences.
 Oxford :—Bodleian Library.
 Paris :—Imperial Library.
 ——— :—Anthropological Society.
 ——— :—Asiatic Society.
 ——— :—Geographical Society.
 ——— :—Ethnological Society.
 Pisa :—Tuscan Society of Natural Sciences.
 Stettin :—Entomological Society.
 Stuttgart :—Natural History Society of Wurtemberg.

St. Petersburg :—Imperial Library.

———— :—Imperial Academy of Sciences.

Stockholm :—Royal Academy of Sciences.

Trieste :—Academy.

United States, America :—Geological Survey of the Territories.

Vienna :—Imperial Geological Institute.

———— :—Anthropological Society.

———— :—Zoological Society.

———— :—Imperial Academy of Sciences.

Washington :—Smithsonian Institution.

———— :—Commissioners of the Department of Agriculture.

ABSTRACT OF PROCEEDINGS OF THE COUNCIL DURING 1876.

January 25th. Special Meeting.

A letter was read from the Hon. E. C. Bayley, C. S. I., regarding certain proposals of Government for the grant to the Society of Rs. 1,50,000 in lieu of the rooms assigned to the Society in the New Museum Building under the Museum Act, and for the repeal of the Act in question, except in so far as it provides for the representation of the Society on the Board of Trustees, the separate notation of the Society's collections and the ultimate reversion of the Society's collections to the Society in the case of the determining of the Trust.

The Council agreed that Mr. Bayley be requested to communicate with the Viceroy and express the general willingness of the Council to accept the proposals of the Government, subject to further knowledge of the proposed changes when definitely settled.

January 27th. Ordinary Meeting.

The Secretary reported that the Sub-Committee appointed by the Finance Committee to ascertain approximately the cost of establishment and of premises, that would be required for carrying out the object of the O. P. Fund in an efficient manner, recommend that the present charges for establishment should be continued, as the Secretaries were of opinion that the work could not be efficiently carried on otherwise.

The recommendation was approved.

Colonel Gastrell suggested the discontinuance of the publication of the Meteorological Observations of the Surveyor General's Office in the Proceedings as Mr. Blanford would publish them in his Meteorological Reports.

The decision of the question was postponed pending the publication of the returns by Mr. Blanford.

February 7th. Special Meeting.

At this Meeting the draft of the New Museum Act was taken into consideration and was approved by the Council on behalf of the Society so

far as the interests of the Society were concerned. The Council also expressed their willingness to accept the sum proposed to be paid in lieu of the accommodation in the New Museum Building provided for the Society under the old Act.

February 24th. Ordinary Meeting.

In reply to a letter from Messrs. Trübner and Co. regarding the selling price of the Society's Journal and Proceedings in England it was ordered that the cost in England of the Journal and Proceedings should be at 3s. and 9d. respectively, with the addition of the average cost of postage to England, viz. :—8d. for the Journal, 4d. for the Proceedings.

On the report of the Natural History Secretary on the extra Number 4, Part II of the Journal containing the late Mr. Blyth's Catalogues of Burmese Fauna, the Council passed a special vote of thanks to Mr. Grote, Lord Walden, Dr. J. Anderson and Dr. G. E. Dobson, for their labours in connection with this work.

March 23rd. Special Meeting.

On this occasion the whole of the Members of the Council present in Calcutta attended to consider the Draft Deed of Release to be signed by the Council on the receipt of the sum of Rs. 1,50,000 from the Government of India in lieu of the accommodation in the New Museum.

The Draft Deed was approved with certain exceptions which were afterwards altered by the Government Solicitor.

March 30th. Ordinary Meeting.

On this occasion also the Meeting was attended by all the Members of Council present in Calcutta, and the Deed of Release was finally approved and duly executed by the Council on behalf of the Society.

The Secretary reported that Rs. 1,50,000 had been received from Government and suggested that the whole sum should be invested at once, such sums as might be required for repairs could be sold out afterwards.

It was ordered that the Manager of the Bank of Bengal should be asked to purchase Government securities for the whole sum to the best advantage.

A letter was read from the Government of Bengal forwarding a letter, No. 405, dated 16th March, 1876, from the Government of India, Home Department, requesting that the Catalogues of Sanskrit MSS. discovered in Bengal might be submitted annually instead of quarterly.

Read the Minutes of the Council on a letter from the Secretary to the Zoological Garden Committee, asking for pecuniary assistance from the Society and suggesting that the President of the Society should be a Member of the General Council of the Gardens, or that the Society should have the right to nominate such a member.

It was ordered that the question be referred to the Finance Committee with a recommendation that Rs. 1,000 should be given to the Gardens, should the funds admit, irrespective of all questions of privileges to be accorded to the Society.

A proposal of the Secretary to employ extra clerks for indexing the records of the Society was sanctioned.

The recommendation of the Finance Committee that the pay of the Duftry Baber Ali should be increased to Rs. 12 per mensem was agreed to.

April 27th. Ordinary Meeting.

An exchange of the Society's publications with those of the United States Geological Survey was sanctioned.

Also with the Civic Museum of Natural History of Genoa.

On an application from the Assistant Secretary for payment from the Conservation of Sanskrit MSS. Fund for work done on account of the Fund, it was ordered that the Government should be applied to for sanction to the payment of Rs. 150 yearly to the Assistant Secretary on the above account.

A Sub-Committee was appointed to take the necessary steps for obtaining a Memorial of Dr. T. Oldham, late President of the Society.

Mr. F. Beaufort, C. S., having expressed his wish to withdraw from the Society on leaving India after 37 years' Membership, the Council agreed as a special case, in consideration of the unusually long time Mr. Beaufort had been a Member of the Society, to continue to send him the publications of the Society free of charge.

The recommendation of the Finance Committee that the consideration of the question of giving a donation of Rs. 1,000 to the Zoological Garden be deferred till it is known what the repairs of the Society's premises will cost, was approved, and the Secretary requested to inform the Honorary Secretary of the Zoological Garden Committee that the Council are unable to give a donation at present as great expense will have to be incurred for the repairs of the Society's premises.

Messrs. R. Taylor and J. O'Kinealy were appointed Members of the Sub-Committee on the Compounding Fee question in place of Messrs. Geoghegan and Schwendler who had left Calcutta.

On the recommendation of Mr. Blochmann it was ordered that the publications of the Society should be supplied to M. Schefer who had been appointed to fill the Chair of Oriental Literature in the University of Paris held by the late M. Jules Mohl, an Honorary Member of the Society.

June 2nd. Ordinary Meeting.

The offer of Mr. W. Macgregor to present the Society with 100 copies of his pamphlet on the Prevention of Accidents from Lightning was accepted with thanks.

Several changes in the rules being suggested, the question of a revised set of rules was referred to a Sub-Committee composed of

Mr. W. T. Blanford.

Mr. H. Blochmann.

Mr. J. O'Kinealy.

Mr. J. Wood-Mason.

Mr. R. Taylor.

Capt. J. Waterhouse.

Mr. Blochmann's request to be allowed to send Arabic MS. No. 444 to Dr. Goeje of Leyden for use in the preparation of the new edition of Tabāri was sanctioned on the condition that it should be returned within six months after date of receipt.

The exchange of the Society's publications with those of the Frankfort Natural History Society was sanctioned.

30th June. Ordinary Meeting.

Read a letter, No. , dated , from the Secretary to the Government of India, Home Department, requesting that the annual Catalogue of Sanskrit MSS., ordered in the Home Department Circular dated 10th March last, should in future be prepared for the calendar and not for the official year.

On the recommendation of the Finance Committee, the salary of Pandit Prem Chand Chaudari was increased from Rs. 30 to 40 per mensem, and that of Sibū, sweeper from Rs. 5-8 to 7 per mensem.

Mr. Blochmann's request to publish an extra number of the Journal Part I. containing extracts from the Survey and other Government reports was sanctioned.

July 4th. Special Meeting.

The Council met to consider the Report of the Sub-Committee on the repairs required to the Society's House.

The report of the Committee was adopted with a few alterations, and it was agreed that the work should be entrusted to Messrs. Mackintosh Burn and Co. and put in hand at once.

The question of new godowns, shops and railing was deferred.

July 28th. Ordinary Meeting.

A letter from Mr. R. S. Brough suggesting the omission of the word 'Troy' after 'grains' in the Meteorological Reports, published with the Society's Proceedings, was referred to the Surveyor General.

Read a letter, No. , dated , from the Secretary to the Government of India, Home Department, sanctioning, in reply to the Society's letter No. 274, dated 5th May, 1876, the transfer from the purchase to the establishment grant for the conservation of Sanskrit MSS. Fund of Rs. 150 to be paid yearly to the Assistant Secretary of the Society.

Read the minutes of the Council on the new estimates and plans furnished by Messrs. Mackintosh, Burn and Co. for the repairs and alterations of the Society's premises.

It was agreed that the whole of the interior alterations and new portico be sanctioned and that the question of the new railing, entrance gate, durwan's lodge, godowns and shops be referred to the Society at large.

July 29th. Adjourned Meeting.

The Finance Committee's recommendation that Babu Buddinath Bysack, Cashier, should be permitted to resign and that his son Kedarnath Bysack should be appointed in his place, the new arrangement being tried for six months before being made permanent, was sanctioned.

The suggestion of the Secretary that an exchange of publications with the Imperial Geographical Society of St. Petersburg should be sought, was agreed to.

The Natural History Secretary reported the following resolution of a Meeting of the Natural History Committee held on the 27th July:

"That the Council of the Asiatic Society be asked to address the Government on the subject of Deep Sea Dredging Operations, to point out that as the Dredging Committee, referred to in the letter from the Government of India, No. 225 dated 26th March, 1872, has not been appointed, the Council would recall to the memory of the Government the previous correspondence, urge that the vessel now being built for the Marine Surveys may be properly equipped and fitted for Deep Sea Dredging, and that advantage be taken of the return into store of the 'Challenger' equipment to apply for a portion of the sounding lines and apparatus and dredging gear.

The Natural History Secretary was ordered to draw up a letter for submission to Government.

September 1st. Ordinary Meeting.

Read a letter from the Surveyor General stating that in future the word 'Troy' would be omitted after 'Grains' in the tables of Meteorological Observations issued from his office.

Estimates were presented from Mr. G. G. Palmer for cleaning and restoring the pictures belonging to the Society, and from Mr. Garrick and Babu Nobin Chunder Dutt for regilding and repairing the frames. Captain Waterhouse and Dr. Waller were asked to make the best arrangement possible for the doing up of the pictures and frames.

A proposal of the Secretary that Dr. Oldham should receive the publications of the Society gratis in consideration of his services to the Society, was agreed to.

November 3rd. Ordinary Meeting.

An offer of Professor E. Cowell of Cambridge to publish a translation of the Sūtras of Sāṅdilya in the Bibliotheca Indica Series was accepted with thanks.

Mr. B. H. Hodgson having called the attention of the Council to the neglected state of the MSS. collected by him in Nepal during 1824 and 1827, and suggested that a catalogue *raisonné* should be made of them, Dr. Rajendralala Mitra proposed the immediate employment of a pundit on Rs. 80 per mensem for the compilation of such a catalogue.

It was ordered that a grant of Rs. 300 should be made to Dr. Mitra for the cataloguing of these MSS., leaving all arrangements to him.

Read a letter from the Secretary to the Trustees of the Indian Museum forwarding a copy of an order of the Trustees to the effect that they agree to accept as correct the lists of the collections made over to them by the Asiatic Society as contained in the catalogues made in 1866 by Dr. Stoliczka and Mr. Ball.

It was ordered that the Trustees be informed that the Society agrees to accept the lists as proposed, and that they be asked to return the Society's copy of the lists duly signed by the Trustees.

November 30th. Ordinary Meeting.

Dr. Rajendralala Mitra's proposal that Professor Bāla Sāstri should receive the Notices of Sanskrit MSS. in place of the late Pandit Rajaram, was sanctioned.

The Secretary was authorised to purchase furniture for the reading room and to proceed with the immediate erection of the new range of godowns.

December 8th. Special Meeting.

This meeting was held to consider Major Godwin-Austen's proposal that the Society should give a grant-in-aid to a Zoological Exploration of Tenasserim by Mr. Ossian Limbörg—the results of the exploration being published in the Society's Journal.

The Council ordered that a sum of Rs. 500, including the unexpended balance of the Rs. 300 granted to the Earth Current Committee, should be placed at the disposal of the promoters of the Tenasserim Zoological Exploration.

On the motion of the CHAIRMAN the Report was unanimously adopted.

COLONEL THUILLIER said—He hoped he might congratulate the Society on the state of its affairs as represented in the report the meeting had just heard read. It was highly satisfactory to find that the finances were in

such a flourishing condition, and that the arrangements with the Government in regard to the Imperial Museum had been brought to the conclusion represented, by which the Society now enjoyed the comfort and advantage of the greatly improved and renovated building they were at present occupying with a certain fixed income accruing from the funded property.

For this state of things the Society was doubtless indebted to the careful and watchful management of the Council and its office-bearers, which had been very conspicuous during the year under review.

To the Joint Secretaries, he considered they were specially indebted for the able and indefatigable manner in which the business of the Society had been carried out, as well as for the regularity of the appearance of the Journal and Proceedings. In the Philological Department, the report just read spoke volumes of the valuable labours of Mr. Blochmann. The Natural History section had been well cared for by Mr. Wood-Mason, whilst in the general department the energy and good management of Captain Waterhouse, especially in all the arrangements connected with the repairs and alterations of the premises entitled him to their special thanks. The good services of Captain Waterhouse to the Society were very marked. He therefore proposed that the cordial thanks of the Meeting be passed to the Secretaries and Treasurer for their continued useful and valuable services to the Society, which he had great satisfaction in bringing to their notice.

The motion was carried unanimously.

The Scrutinisers reported the election of Officers and Members of Council for 1877 as follows :

The Hon. Sir E. C. Bayley, K. C. S. I.

President.

Dr. Rájendralála Mitra, Rái Bahádur.

Col. H. L. Thuillier, R. A., C. S. I.

W. T. Blanford, Esq.

Capt. J. Waterhouse.

H. Blochmann, Esq., M. A.

J. Wood-Mason, Esq.

H. B. Medlicott, Esq.

The Hon. Sir E. C. Bayley, K. C. S. I.

Dr. Rájendralála Mitra, Rái Bahádur.

Col. H. L. Thuillier, R. A., C. S. I.

W. T. Blanford, Esq.

H. Blochmann, Esq., M. A.

Capt. J. Waterhouse.

J. Wood-Mason, Esq.

Dr. T. R. Lewis.

J. O'Kinealy, Esq., C. S.

} *Vice-Presidents.*

} *Secretaries and Treasurer.*

} *Members of Council.*

Bábu Prannáth Pandit, M. A.*

Dr. W. K. Waller.

Dr. D. B. Smith.

H. B. Medlicott, Esq.

T. S. Isaac, Esq.

Dr. J. Anderson.

} *Members of Council.*

The following gentlemen were elected to audit the Annual Accounts for 1876.

R. Taylor, Esq., C. S.* and Major H. H. Godwin-Austen.

The Meeting was then resolved into the Ordinary Monthly General Meeting.

Col. H. L. THUILLIER, C. S. I., Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From Dr. W. K. Waller, a copy of "Studies in Ancient History," comprising a reprint of "Primitive Marriage," by J. F. McLennan, LL. D.

2. From the Author, a copy of 'La langue et la littérature Hindoustanie en 1876', by M. Garcin du Tassy.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members—

Mr. William Croke, C. S. ; Captain G. F. L. Marshall, P. H. D.

The following are candidates for ballot at the next Meeting—

Mr. Bazett Wetenhall Colvin, C. S., proposed by the Hon. Sir E. C. Bayley, K. C. S. I., seconded by Col. H. L. Thuillier, C. S. I.

* Rev. A. G. Medlycott, proposed by Dr. E. W. Chambers, seconded by Mr. Alex. Wilson.

* Mr. C. B. P. Gordon and Capt. T. Deane have intimated their desire to withdraw from the Society.

The CHAIRMAN announced to the Meeting that the New Museum Act had received the Viceroy's assent. The only point affecting the Society was the allotment of five, instead of four, Trustees to represent the interests of the Society.

* As Mr. Taylor was unable to undertake the task of auditing the accounts Mr. Waldie kindly did so in his place.

The following is the Act :—

ACT NO. XXII OF 1876.

PASSED BY THE GOVERNOR GENERAL OF INDIA IN COUNCIL.

*(Received the assent of the Governor General on the 17th of
December 1876.)*

An Act to provide for the management of the Public Museum at Calcutta.

WHEREAS, by Act No. XVII of 1866, reciting that it was expedient to provide for establishment of a Public Museum at Calcutta, to be called the Indian Museum, it was enacted that the Governor General in Council should cause to be erected at the expense of the Government of India a suitable building in Calcutta, to be devoted in part to collections illustrative of Indian Archæology and of the several branches of Natural History, in part to the preservation and exhibition of other objects of interest, whether historical, physical or economical, in part to the records and offices of the Geological Survey of India, and in part to the fit accommodation of the Asiatic Society of Bengal and to the reception of their library, manuscripts, maps, coins, busts, pictures, engravings and other property ; and it was also enacted that the Government of India should keep the said building in repair and pay and defray the salaries, allowances and pensions of the officers and servants, and all other expenses connected with the said Museum ; and by the Act now in recital certain officials and other persons therein mentioned or referred to, to the number of thirteen, and their successors, were constituted a Body Corporate by the name of the Trustees of the Indian Museum, and the said Trustees were empowered to receive bequests, donations and subscriptions, and to deal with the same in the manner therein mentioned for the purposes of their trusts therein mentioned ; and it was also enacted that the said Trustees should have the exclusive possession, occupation and control, for the purposes of such trusts, of the said building, other than those portions thereof which, upon its completion, should be set apart by the said Trustees for the records and offices of the said Geological Survey and for the accommodation of the said Asiatic Society and the reception of their library, manuscripts, maps, coins, busts, pictures, engravings and other property ; and it was also enacted that all officers and servants, salaried or otherwise, employed in the care or management of the trust-property, should be appointed, and might be removed or suspended, by the said Trustees, subject to such regulations and conditions as the said Trustees should think proper ; and it was also enacted that the Council of the said Asiatic Society should cause the collections belonging to such Society, and illustrative of Indian Archæology and the several branches of Natural History, and all additions that might be made thereto, to be removed to and deposited in the said building at the expense of the Government of India as soon as the same should be completed so far as to be

in a condition to receive the said collections, and that an inventory of the articles in such collections should be made by the said Society, one copy whereof was to be signed by the said Trustees and kept by the said Society, and another copy was to be signed by the said Society and kept by the said Trustees, and that the said Society should continue to have the same exclusive property in and control over their said library, manuscripts, maps, coins, busts, pictures and engravings which they then possessed, and that the Council of the said Society should have the exclusive possession, occupation and control, for the purposes of the said Society, of those portions of the said building which should be set apart for the accommodation of the said Society and the reception of their library and other property therein, before mentioned ;

And whereas the Government of India has caused the said building to be erected, and the Council of the said Society has caused the said collections belonging to the same Society to be removed to and deposited in the said building at the expense of the Government of India ; and an inventory of the articles in such collections has been made by the said Society, one copy whereof has been signed by the said Trustees and delivered to the said Society, and another copy has been signed by the Council of the said Society and delivered to the said Trustees ;

And whereas the said Trustees have, in pursuance of the said Act, set apart certain portions of the said building for the said records and offices of the Geological Survey of India ;

And whereas, in consideration of a sum of one hundred and fifty thousand rupees paid to them by the Government of India, the Council of the said Society has relinquished the exclusive possession, occupation and control secured to them by the said Act, of the portions of the said building which, under the said Act, were to be set apart for the accommodation of the said Society and the reception of their said Library and other property ;

And whereas it is expedient to alter the constitution of the said Body Corporate and to amend the law relating to the appointment and salaries of the said officers :

And whereas under the circumstances aforesaid it is expedient to repeal the said Act, and to re-enact it with the modifications hereinafter appearing ; It is hereby enacted as follows :—

Preliminary.

1. This Act may be called “The Indian Museum Act, 1876.”

2. Act No. XVII of 1866 (*to provide for the establishment of a Public Museum at Calcutta*) shall be repealed. But all persons nominated under the said Act as Trustees of the Indian Museum, and all officers and servants appointed under the same Act and now holding office, shall be deemed to have been respectively nominated and appointed under this Act.

Incorporation of the Trustees.

3. The Trustees of the said Indian Museum shall be—
such Secretary to the Government of India as the Governor General in Council from time to time directs in this behalf,
the Accountant General,
five other persons to be nominated by the Governor General of India in Council,
the President of the Asiatic Society of Bengal and four other Members of the Council of the said Society for the time being, to be nominated by the Council of the said Society,
the Superintendent of the Geological Survey of India, and
three other persons to be elected by the Trustees for the time being and appointed under their common seal;
and such Trustees and their successors shall, subject to the provisions hereinafter contained, be and are hereby constituted a Body Corporate by the name of the "Trustees of the Indian Museum," and shall have a common seal, and by such name shall have perpetual succession; and all the powers of the said Corporation may be exercised so long and so often as there shall exist seven Members thereof.

4. The persons for the time being holding the offices respectively mentioned in section three shall be *ex officio* Members of the said Body Corporate, and shall cease to be such Members respectively upon ceasing to hold the said offices respectively :

Provided that, whenever the said Secretary to the Government of India, Accountant General or Superintendent of the Geological Survey of India is also the President of the said Society, the Council of the said Society may nominate any other person, being a Member of the said Society, to be a Trustee under this Act so long as such presidency is held by the said Secretary, Accountant General or Superintendent.

5. If any of the said Trustees for the time being dies or is absent from India for more than twelve consecutive months, or desires to be discharged, or refuses or becomes incapable to act, or not having been an *ex officio* Member of the said Body Corporate becomes such, or if any of the Trustees to be nominated by the Council of the said Society ceases to be a Member of such Council, then and in every such case the authority which appoints the Trustee so dying, being absent from India, desiring to be discharged, refusing or becoming incapable to act, or becoming an *ex officio* Member as aforesaid, or ceasing to be such Member of Council as aforesaid, may appoint a new Trustee in his place according to the provisions of section three,

and every Trustee so appointed shall thereupon become and be a Member of the said Body Corporate as fully and effectually as if he had been hereby constituted a Trustee.

Powers of the Trustees.

6. It shall be lawful for the said Trustees (a) to receive bequests, donations and subscriptions of land, buildings, money and any such objects of interest as aforesaid, and (b) to hold the same and to lay out such money for the maintenance, improvement and enlargement of the collections deposited in, presented to, or purchased for, the said Indian Museum, and otherwise for the purposes of the same Museum ;

and all such collections shall become the property of the said Trustees for the purposes of their trusts herein mentioned ;

and the said Trustees shall have the exclusive possession, occupation and control, for the purposes of such trusts, of the whole of the said building, other than those portions thereof which have been set apart by the said Trustees for the records and offices of the Geological Survey of India.

7. The said Trustees may from time to time make bye-laws consistent with this Act—

(a) for the management of the said Museum ;

(b) for the summoning, holding and adjournment of general and special meetings of the said Trustees ;

(c) for securing their attendance at such meetings ;

(d) for the provision and keeping of minute-books and account-books ;

(e) for the compiling of catalogues, and

(f) for all other purposes necessary for the execution of their trusts.

8. Subject to such regulations and conditions as the Trustees think fit, they shall appoint, and may remove or suspend, all officers and servants, salaried or otherwise, employed in the care or management of the trust-property : provided—

(a) that no officer be appointed without the approval of the Governor-General in Council if such officer be, at the date of his appointment, in India, or without the approval of the Secretary of State for India in Council if such officer be not then in India ;

(b) that no new office be created, and no salaries of officers be altered, without the previous sanction of the Governor-General in Council.

9. The said Trustees may from time to time order any duplicates of printed books, medals, coins, specimens of Natural History or other curiosities deposited in the Indian Museum to be exchanged for manuscripts, books or other objects of interest, or direct any such duplicates to be sold and the money to arise from such sale to be laid out in the purchase of manuscripts, books, maps, medals, coins, specimens of Natural History or other curiosities that may be proper for the said Museum.

10. At all meetings of the said Trustees three shall be a quorum for the transaction of business and for the exercise of any of the powers conferred upon them by this Act.

Duties of the Trustees.

11. The said Trustees shall furnish to the Government of India, on or before the first day of December in each year, a report of their several proceedings for the past twelve months, and further shall furnish, on or before the same day in each year, to such Auditor as the Governor General in Council appoints in this behalf, accounts of all moneys expended by the Trustees during the past twelve months, supported by the necessary vouchers.

The said Trustees shall cause such report and accounts to be annually published for general information.

12. The said Trustees shall cause every article in the said collections belonging to the Asiatic Society, and all additions that may hereafter be made thereto otherwise than by purchase under section six, to be marked and numbered, and (subject to the provisions contained in sections nine and fifteen) to be kept and preserved in the said Indian Museum with such marks and numbers; and an inventory of such additions shall be made by the said Society, one copy whereof shall be signed by the said Trustees and delivered to the said Society, and another copy shall be signed by the Council of the said Society and delivered to the said Trustees, and shall be kept by them along with the inventory already delivered to the said Trustees as aforesaid.

13. All objects taken in exchange under section nine for, and all moneys payable on sale under the same section of, any of such articles, shall be held on trusts and subject to powers and declarations corresponding as nearly as may be with the trusts, powers and declarations by this Act limited and declared concerning the same articles.

Miscellaneous.

14. All officers and servants appointed under this Act shall be considered public servants within the meaning of the Indian Penal Code; and so far as regards their salaries, allowances and pensions and their leave of absence from duty, they shall be subject to the rules for the time being applicable to uncovenanted civil servants of the Government of India.

15. In the event of the trust hereby constituted being determined, all collections then in the said Indian Museum, other than those next hereinafter mentioned, shall become the property of the Government of India, and the collections and additions mentioned in section twelve shall become the property of the said Society or their assigns.

The CHAIRMAN laid before the Meeting the following Circular received from the Royal Academy of Sciences of Turin regarding the establishment of the Bressa Prize, which would be of interest to the Members of the Society.

THE BRESSA PRIZE.

The last Will and Testament of CESARE ALESSANDRO BRESSA, Doctor in Medicine and Surgery, signed the 4th September, 1835, contains the following clause :

"I leave all my property present and future, after paying certain legacies, to the Royal Academy of Sciences of Turin. The Academy may be represented by its Secretary, or by an attorney elected for that purpose by the resident members.

"On the decease of Signora Claudia Amata Dupéché, who has a life interest in all my possessions, the Royal Academy of Sciences of Turin will immediately enter in possession of everything, and may sell ground property, put capital out to interest, in any and whatever way it may find most profitable, and with the interest of this property a biennial prize is to be established, which will be adjudged in the following manner, *viz.* :—

"The net interest of the first two years to be given in premium to that person of whatever nation or country he be, who shall have, during the previous four years, made the most important discovery, or published the most valuable work on Natural and experimental Philosophy, Natural History, Mathematics, Chemistry, Physiology and Pathology, as well as Geology, History, Geography and Statistics."

"The net interest of the following two years to be given only to an Italian, who, by judgment of the above named Academy of Turin, shall have made the most important discovery, or have published the most important work, on any of the above mentioned sciences.

"The prize will continue to be distributed in the same order."

While fully aware of the great responsibility which rests on it, in being called to judge the productions of human intellect in a sphere so vast as to comprise nearly all the positive sciences, the Academy has accepted the task, with the intention of fulfilling to the utmost the generous wishes of the testator with regard to the promotion and advancement of Science.

The Bressa legacy remained free from all claims until the month of July 1876, consequently the first biennial term mentioned in the will, will include the years 1877—1878.

The first prize will be given in the year 1879 to that person, of whatever nation or country he be, who shall have, during the four previous years, made the most important and useful discovery, or published the most celebrated work, on any of the above-mentioned sciences.

The value of the first prize amounts to 12,000 Italian Lire.*

In accordance with the spirit of Dr. Bressa's will, the Academy will choose the best work or discovery, whether, or not, it be presented by the Author.

The prize in no case will be given to any of the National members of the Academy of Turin, resident and non-resident.

In the year 1881 the second Bressa Prize will be given for the prece-

* The Italian lira appears to vary in value from 7·8*d.* to 5·4*d.*—the above sum would therefore be between £370 and £490.—ED.

ding quadriennial term 1877—1880, according to the above rules, except that in obedience to the testator's wishes it can only be conferred on an Italian.

And so on, every four years there will be a Bressa Prize for competition among scientific men of any part of the world, and every four years a Bressa Prize, which can be competed for by Italians only.

Turin, December 7th, 1876.

The President of the R. Academy

FEDERIGO SCLOPIS.

*The Secretary of the Class
of Physical and Mathematical
Sciences.*

ASCANIO SOBRERO.

*The Secretary of the Class
of Moral, Historical and Philological
Sciences,*

GASPERE GORRESIO.

MR. WOOD-MASON exhibited a specimen of a Newt, which he had detected in a small collection of insects and other objects recently made by Colonel G. B. Mainwaring in the Darjiling hills and said:—"The specimen is" in the highest degree interesting not only as being the first example of Tailed Amphibian that has ever been found in India, but also as being an individual of the remarkable species described by Dr. J. Anderson (P. Z. S. 1871, p. 423) from specimens obtained by him around the little Chinese town of Nantin and in various other parts of the same region. *Tylototriton verrucosus*, as the animal has been called by Dr. Anderson, lives, in Western China, in flooded rice-fields, but in Sikkim, according to Colonel Mainwaring, in damp situations amongst decaying leaves and sticks. There is, however, nothing remarkable in this difference of habit, for the common eft of Europe is not unfrequently to be found on dry land at some distance from water under logs of wood, there being no necessity for the Urodelous Amphibia, after they have passed through that stage of their existence during which they are provided with external gills for aquatic respiration, to keep to the water. The entire order of Tailed Amphibia is confined to the temperate parts of the northern hemisphere, but two species have already been described from countries the fauna of which is largely leavened by Indo-Malayan forms, *Cynops chinensis* having been recorded from near Ningpo and *Plethodon persimilis* from Siam. This occurrence of a newt within the limits of the Oriental region is far from being without a parallel in other groups of animals also; *Nectogale* (vide W. T. Blanford, P. A. S. B., 1876, p.), *Anurosorex*, probably also *Crossopus*, and a host of animals, vertebrate and invertebrate, extending still further southwards, being only to be looked upon as stragglers from the Palaearctic region, or as outposts of it, to use the happy phrase of Dr. Günther. The only other form of newt at all resembling *T. verrucosus*, in which horny matter accumulated at the points where the ends of the ribs project against the external integument forms on each side of the middle line of the body along the upper side of the flanks a conspicuous row of great

rough horny tubercles, is *Pleurodeles*, in which these bosses are sometimes so highly developed as to have given rise to the incorrect notion that the ends of the ribs projected free through the skin.

The following papers were read:—

- 1.—*Rough Notes on some Ancient Sculpturings on Rocks in Kamdón, similar to those found on Monoliths and Rocks in Europe.*—By H. RIVETT-CARNAC, C. S.

(Abstract.)

Mr. Rivett-Carnac describes the "cup-marks" observed by him on a rock about $2\frac{1}{2}$ miles south of Dwará-Háth, and 12 miles north of Ránikhet in Kamdón, which resemble the cup-marks on the tumuli of Central India, noticed by him in the Proceedings for February, 1870, and those described by the late Sir James Simpson in his 'Archaic Sculpturings'. Near the rock is a Mahádeo Temple, known as the 'Chandeshwar Shrine'.

The cup-marks themselves are of two types, *first*, holes scooped out on the face of the rock, varying in size from 6 inches to $1\frac{1}{2}$ in. in diameter; *secondly*, 'ringed cups', each cup being surrounded by an incised ring. The latter marks, therefore, are but horizontal sections of the *lingam* placed on the *yoni*, and are thus ultimately connected with Mahádeo worship.

Though Sir J. Simpson summarily dismisses the theory of the cup-marks having reference to *lingam* worship, Mr. Rivett-Carnac adduces striking proofs of the correctness of this view, which is moreover confirmed by the sketches accompanying the paper.

Mr. Rivett-Carnac hopes to trace the rocks with their markings "from Madras through Central India and the Himálaya, and thus on through Central Asia to the Crimea and South Eastern Europe, and from thence to our own Islands. And if this is done, then there would seem to exist a sufficiently distinct tracing of the routes adopted by the tribe, one section of which went west, the other south, at a period of which there is but a faint historical record save on rough stones and temples with their markings of a type which are common to both Europe and India."

The paper concludes with interesting references to this subject from Madras and home papers.

It will be printed in No. I, Pt. I, for 1877.

- 2.—*On the Final Stage in the Development of the Organs of Flight in the Homomorphic Insecta.* By J. WOOD-MASON.

(Abstract.)

"La dernière mue développe subitement les organes du vol dans toute leur étendue par une transformation vraiment merveilleuse et encore inexpiquée, car on ne comprend pas comment des organes aussi volumineux peuvent être renfermés dans les petites gaines où ils se forment pendant la période de nymphe." DE SAUSSURE, *Mission Scientifique au Mexique et dans l'Amérique Centrale, Recherches Zoologiques, VI^e Partie, 1^{re} Sect., Études sur les Orthoptères*, 1872, p. 224.

"When an insect quits the egg it has no wings nor the slightest rudiments of such, these making their first appearance at one of the earlier changes of skin as slight prolongations of the posterior angles of the dorsal arcs of the two hindmost divisions of the thorax, the mesothorax and the metathorax. These prolongations are so many duplicatures or flattened evolutions of the integument, the chitinous membrane that covers them above and below and on the edges being in direct continuity with that which covers the insect's body,—being, in fact, part of it,—and the intermediate cellular layer which produces this chitinous membrane being similarly continuous with that which underlies the skin of the rest of the insect's body. They increase in size slightly at each successive moult, soon acquiring a definite triangular form and the principal nervus dividing the wing into its two principal areas; but relatively to the future wings they are small and insignificant even at the last moult, at which the organs of flight are suddenly developed to their fullest extent. If a wing-rudiment be examined just prior to a moult, it is found that its external chitinous covering has separated off so as to be easily detachable from a new wing-rudiment that has formed beneath it; and that the new wing-rudiment itself lies quite flat within its sheath, as the portion of the chitinous external layer which covers it may be called after its detachment. The new wing-rudiments are found to lie similarly flat within their sheaths at every change of skin down to and including the last but one, into the interval between which and the last it is that the growth of the wings from small and insignificant rudiments to their full extent is compressed. The penultimate change of skin accomplished, new wing-rudiments are produced in due course from the cellular layer, and, at the time when their sheaths first become detachable from them, they, like all their predecessors, lie extended quite flat within these sheaths; but the detachment of these is no sooner accomplished than they commence to grow with great rapidity. The first outward and visible signs of the growth that now ensues are the thickening of the prolongations (which up to this time were thin plates with thin and sharp edges closely embracing the insect's body, but which now gradually become biconvex masses with thick and blunt edges standing out from it) and the gradual obliteration of the principal nervure. The walls of the sheaths soon become distended to such a high degree of tenuity and consequent transparency under the enormous pressure put upon them from within by the rapidly growing wings, that it is possible to see, even without dissection, the manner in which these are forced to arrange themselves in so limited a space: it can be seen that the wings have thrown themselves into a multiplicity of closely-packed transverse folds representing increments of growth in length and that these again have disposed themselves, in groups, in wavy (longitudinal) folds representing growth in breadth; so that

the wings plaited and folded up in this complex manner present a superficial resemblance to the surface of a much convoluted brain or to a portion of a transverse section of a Labyrinthodont tooth. This mode of development of the wings obtains in all Orthopterous insects, upon larvæ of which these observations are mainly based; at least in some Neuroptera (*Termes*); and probably universally in the groups which Westwood long ago collectively termed the Homomorphie Insecta."

3.—*List of the Mollusca collected by Dr. J. Anderson, in Yunnan and Upper Burmah, with descriptions of the new species. By G. NEVILL, C. M. Z. S.*

This paper will be printed in the Journal, Pt. II, No. 1, for the current year.

4.—*List of the Mollusca collected by the late Dr. Stoliczka when attached to the Embassy under Sir D. Forsyth in Yarkand and Ladak, with descriptions of the new species. By G. NEVILL, C. M. Z. S.*

This paper will be printed in Journal Part II, No. 1, for the current year.

5.—*On a case of Lightning; with an Evolution of the potential and quantity of the Discharge in Absolute Measure.—By R. S. BROUGH.*

The S. W. monsoon of 1871 may be considered to have been characterized in the neighbourhood of Calcutta no less by its copious and protracted rainfall than by the violence and frequency of its thunderstorms. During the progress of one of these storms in the early part of the monsoon, one of the trees standing near the gate of the compound of the building, then occupied by the Sadr Diwāni Adālat, and now used as the European Military Hospital, in Lower Circular Road, was struck by lightning. The branches of this tree overhung the wires of the Telegraph line, from which they were only about a foot distant. The discharge passed from the tree to the wires (of which there are four), broke fourteen double cup porcelain insulators, and passed to earth through the iron standards on which the wires are supported.

The one ends of all the four wires were connected to earth through instruments in the Calcutta Telegraph Office, at a distance of about $5\frac{1}{2}$ miles from the locality of the accident. The other ends were connected as follows to earth through instruments: the first at the Telegraph Workshops, a distance of less than $\frac{1}{2}$ mile; the second at the Lieutenant-Governor's residence, less than $\frac{1}{2}$ mile; the third at Atchipur, less than 14 miles; and the fourth at Diamond Harbour, less than 25 miles. At the moment of the discharge nothing extraordinary was noticed at any of these offices.

It is often far too generally stated in text-books that lightning invariably follows the best conductor to earth. This statement is misleading at the best; and is absolutely untrue if the word "conductor" be employed in the sense to which it is usually restricted in electrical science. In this instance, for example, we find that the lightning broke 14 insulators, each having probably an electrical resistance of several thousand megohms, in preference to traversing a wire resistance of not more than 500 ohms to earth through the receiving instrument in the Telegraph workshops. The writers appear to overlook the fact (experimentally illustrated long ago by Faraday) that there is exerted a mechanical stress proportional to the square of the potential tending to produce disruptive discharge, as well as an electromotive force proportional to the simple potential tending to produce a conductive discharge. Thus the discharge may occur either along a path of minimum mechanical resistance or along a path of minimum electrical resistance. Which form of discharge will occur in any particular instance depends of course on the special circumstances of the case; but, generally speaking, as the potential increases the tendency naturally is (*cet. par.*) for the disruptive to predominate over the conductive. In the case of lightning the potential is so great, that for any form of "lightning-protector" to be efficient, the conductive facilities offered must be correspondingly great, that is, the protector must offer no sensible resistance to earth, otherwise a disruptive discharge may take place from the protector itself, which under these circumstances becomes merely a source of danger.* This tendency to disruptive discharge is taken advantage of to protect Telegraph instruments from lightning. An earth wire is brought very near to the line wire, from which it is insulated by only a very thin stratum of air: when the potential of the line wire rises abnormally, a disruptive discharge takes place at this point and the receiving instrument is thus saved.

I have twice lately seen it stated that Sir W. Thomson found that the resistance of air to disruptive discharge decreased as the thickness of the

* It is very necessary therefore that all systems of lightning-protectors should be tested for resistance from time to time. Mr. Schwendler's method of quantitatively testing "earths" has already been described before the Society. (Journal A. S. of Bengal, Part II, Vol. XL, 1871). In this method two temporary auxiliary earths are required. Calling the resistance of the lightning discharger earth x , and that of the auxiliary earths, respectively y and z , the three resistances $x + y = a$, $x + z = b$ and $y + z = c$ are measured by any accurate method most convenient (*e. g.* Wheatstone's Bridge, Differential Galvanometer, Tangent or Sine Galvanometer, &c. or even an empirically calibrated galvanoscope) the mean of positive and negative readings being taken to eliminate any natural *E. M. F.* between the earths. From the results thus obtained the unknown resistance x can be calculated by the formula

$$x = \frac{a + b - c}{2}$$

stratum increased; and a French writer has referred the possibility of the occurrence of lightning discharges several kilometres in length to this cause. Sir W. Thomson's earlier experiments certainly shewed this unexpected result, probably due to the minute distances at which he was operating, but a later series of experiments, made at larger distances, shewed this result in a much less marked degree; and Sir W. Thomson himself says, "It seems most probable that at still greater distances the electromotive force will be found to be sensibly constant, as it was certainly expected to be at all distances*."

Another assertion of the text-books is that the metallic rods now employed as lightning-protectors on buildings do not "attract" lightning. This statement is literally true, according to the meaning of the word "attract", but is untrue in effect. For such a rod-lightning-protector determines a line of maximum induction, and a discharge is more likely to occur at the place than if the protector were not there. Prof. Clerk Maxwell does not appear to hold this opinion; but it seems to me unquestionable that if a charged thunder-cloud, driving before the wind, is carried over a building furnished with a lofty metallic rod, discharge is more likely to occur than if the rod were away. In proof of this, I may refer to the case reported by Mr. Pidgeon in "*Nature*," and subsequently discussed before the Society of Telegraph Engineers (Proc. 12th May, 1875), in which the Flag-staff acted the part of an ordinary "lightning-protector."

Prof. Clerk Maxwell observed in his paper recently read before the British Association at Glasgow, that such lightning-protectors are designed rather to relieve the charged cloud than to protect the threatened building. In fact lightning-rods are legitimately employed for this very purpose in the vineyards, where the object in view is to relieve charged clouds and prevent disruptive discharges and the consequent showers of hail.

Under ordinary circumstances, however, the noise and light of the lightning flash must be regarded as a very harmless, if disagreeable, way of getting rid of some of the potential energy of electrical separation.

The protection of cities on the same principle, even if necessary or desirable would be too expensive and unsightly ever to be put in practice. But Faraday has proved that if our houses were made of metal, they would constantly remain at the potential of the earth, we should virtually be "under-ground," and live within them in perfect security. The iron churches occasionally employed in Europe fulfil this condition exactly. It is not of course usually practicable to live in metal houses, but we can live in almost equally effective metal cages formed by running conductors connected to earth along the summit, eaves, and corners of our houses†.

* Papers on Electrostatics and Magnetism, p. 259.

† This portion of this paper was written before the meeting of the British Association at Glasgow.

The usual rod-protectors appear to be only suitable to such structures as themselves determine lines of maximum induction, *e. g.* church spires, factory chimnies, flagstuffs, &c.

The case of lightning referred to at the beginning of this paper is of peculiar interest because we know precisely the mechanical effect produced by the flash, and from this we can work back and estimate roughly the potential and quantity of the electrical discharge.

In the first place we can calculate the force required to burst the cylindrical portion of the porcelain insulator into which the iron stalk is cemented.

Let r = radius of the inside of the cylinder

R = „ „ outside „

and F = the resistance to bursting

$$\text{Then,} \quad F = \frac{f R^2 - r^2}{R^2 + r^2}$$

where $f = 66 \times 10^4$ grammes on the square centimetre.

Now the line wire was bound to the insulator by a thinner wire passing round it. The surface density could not have been uniform round the binding wire, but must have been greatest on the side touching the insulator.

By the method of electrical images in two dimensions it may be shewn that the surface density (σ) on the inner side of the binding wire is approximately

$$\sigma = \frac{Q}{4 \pi^2 R \sqrt{d-a} (\sqrt{d+a} - \sqrt{d-a})}$$

where Q is the total charge on the binding wire, d the distance of the binding wire from the stalk of the insulator, and a the radius of the binding wire.

$$\text{But } 2 \pi \sigma^2 = F$$

$$\therefore \sigma = \sqrt{\frac{F}{2 \pi}}$$

Whence

$$Q = \sqrt{\frac{F}{2 \pi}} \cdot 4 \pi^2 R \sqrt{d-a} (\sqrt{d+a} - \sqrt{d-a})$$

which is the expression for the quantity of the charge on one insulator. As there were 14 insulators broken, this result must be multiplied by 14 in order to obtain the total quantity of the discharge.

Again the electrostatic capacity of the binding wire is

$$S = \frac{2 \pi R c}{d + \sqrt{d^2 - a^2}} \log e \frac{d - \sqrt{d^2 - a^2}}{d + \sqrt{d^2 - a^2}}$$

where $c = 1.9$ about.

But $VS = Q$

$$\therefore V = \frac{Q}{S} = \sqrt{\frac{F}{2\pi}} \cdot \frac{2\pi}{c} \cdot \sqrt{d-a} \left(\sqrt{d+a} - \sqrt{d-a} \right) \\ \times \log e \frac{d + \sqrt{d^2 - a^2}}{d - \sqrt{d^2 - a^2}}$$

which is the expression for the potential of the discharge.

Now in the particular case under consideration

$$r = 1.500 \text{ c. m.}$$

$$R = 3.000 \text{ c. m.}$$

$$d = 2.250 \text{ c. m.}$$

$$\text{and } a = 0.125 \text{ c. m.}$$

$$\text{Hence } F = 396 \times 10^9 \text{ grammes per sq. centimetre.}$$

$$\left. \begin{array}{l} 14 Q = 50586.5 \\ V = 722.7 \end{array} \right\} \text{absolute electrostatic C. G. S. units.}$$

Changing the units to the ordinary ones in practical use, we find

$$14 Q = 16.86 \text{ microfarads.}$$

$$V = 216810 \text{ volts.}$$

Assuming the sparking distance to increase as the square of the potential, it can be calculated from the experimental results obtained by Messrs. Warren de la Rue and Muller (Proc. Roy. Soc. Jan. 1876,) namely, that 1000-rod chloride of silver cells give a spark 0.009166 inch, that a difference of potentials of 216810 volts would produce a spark in air between two electrodes at a distance of about 36 feet apart. This is of course a relatively very short distance, but it must be remembered that we have only taken into consideration that portion of the energy of the discharge which was employed in breaking the 14 insulators, and have neglected all that was spent in heat, light, &c.

The reading of the following papers was postponed—

1.—*Note on the Variation of the Barometric Tides in connection with diurnal Land and Sea Breezes.* By HENRY F. BLANFORD.

2.—*The Kaimûr Range.* By CHANDRASEKHARA BÂNURJI.

The Meeting then adjourned.



LIBRARY.

The following additions have been made to the Library since the Meeting held in January last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS,
presented by respective Societies or Editors.

- Birmingham. Institution of Mechanical Engineers,—Proceedings, Pts. I, and II, 1876.
- Königsberg. Physikalische—O'ekonomische Gesellschaft,—Schriften, Jahrgang 16, Abth. I, II, 1875.
- Leipzig. Deutsche Morgenländische Gesellschaft,—Abhandlungen, Band 6, Np. 2.
- F. Stenzler.*—Indische Hausegelen. Paraskara, Text.
- London. The Athenæum,—Nos. 2554 and 2568, 1877.
- . The Institute of Civil Engineers,—Minutes of Proceedings, Vol. 46, Pt. 4, 1875-76.
- . The Anthropological Institute,—Vol. 6, No. 2, October, 1876.
- Dr. Comrie.*—Anthropological Notes on New Guinea. *A. Taylor.*—On the Origin of Numerals. *H. Clarke.*—On Prehistoric Names of Weapons. *Dr. Lubach.*—On the Hunebedden or Cromlechs in the Province of Drenthe, in Holland.
- . Nature,—Vol. 15, No. 367, 1877.
- . Royal Astronomical Society,—Monthly Notices, Vol. 36, No. 9.
- . The Royal Society,—Proceedings, Vol. 25, No. 173.
- J. G. Jeffreys.*—Preliminary Report of the Biological Results of a Cruise in H. M. S. "Valorous" to Davis Strait in 1875. *W. B. Carpenter.*—Report on the Physical Investigations carried on by P. Herbert Carpenter, in H. M. S. "Valorous," during her Return Voyage from Disco Island in August, 1875.
- . The Statistical Society,—Journal, Vol. 39, Pt. 3.
- . The Zoological Society,—Proceedings, Pts. I, II, and III, 1876.
- Pt. I. *L. Taczanowski.*—Description d' un nouveau cerf tachoté du pays d' Ussuri méridional, *Cervus Dybowskii.*
- Pt. II. *A. Anderson.*—Corrections of, and Additions to, "Raptorial Birds of N. W. India."
- Pt. III. *Dr. Günther.*—Remarks on some Indian and more especially Bornean Mammals. *G. E. Dobson.*—On *Mystacina tuberculata*. *W. T. Blanford.*—Note on "Africa-Indien" of A. von Pelzeln, and on the Mammalian Fauna of Thibet. On some of the Specific Identification in Dr. Günther's Second Report on Collections of Indian Reptiles obtained by the British Museum. *Lieut. R. W. Ramsay.*—On an undescribed species of Nuthatch and another Bird from Karennee.

London. The Zoological Society,—Transactions, Vol. 9, Pts. 8 and 9, 1876.

Pt. 8. *Prof. Owen*.—On the Osteology of the *Marsupialia*, Pt. 5.

Pt. 9. *O. Salvin*.—On the Avifauna of the Galapagos Archipelago.

Munich. Königliche Bayerische Akademie der Wissenschaften,—Mathematisch-Physikalische Classe. Sitzungsberichte, Heft III, 1875, Heft I. 1876.

Heft. 1. *v. Bezold*. Ueber die Vergleichung von Pigmentfarben mit Spectralfarben.

———. Philosophisch-Philologische Classe, Sitzungsberichte
Band I, Heft 1 to 3, and Band II, Heft 2 to 4.

Mathematisch-Physikalische Classe, Abhandlungen,
Band 12, Abth. 2.

Palermo. Società degli Spettroscopisti Italiani—Memorie, Dispensa 12, Decembre, 1876.

Paris. Journal Asiatique,—7me Série, Tome VIII, No. 1, 1876.

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———. L'Académie Impériale des Sciences de St. Petersburg,—Bulletin,
Tome XX, Nos. 3 and 4; Tome XXI, Nos. 1 to 5.

Tome XXI. No. 1. *J. F. Brandt*.—Recherches sur le lapin (*Lepus cuniculus*), au point de vue zoo-géographique et paléontologique. *A. Sawitsch*.—Observations des planètes à St. Petersburg.

No. 3. *II. Wild*.—Anémomètre muni d'un simple appareil pour la mesure de la force du vent. *O. Bothlingk*.—Notes pour servir à la critique et à l'explication de divers ouvrages Sanskrits.

No. 4. *K. E. v. Baer*.—La mer Carienne mérite-t-elle le nom de glacière?
II. Wild.—Recherches photométriques concernant la lumière diffuse du ciel.

No. 5. *O. Bothlingk*.—Questions touchant l'orthographe Iakoute. *L. Cienkowski*.—Sur la morphologie des Alotrèches.

———. L'Académie Impériale des Sciences de St. Petersburg,—Mémoires,
7me Série, Tome XXII, Nos. 4 to 10; Tome XXIII, No. 1.

Tome XXII, No. 4. *Dr. W. Gruber*.—Monographie über die aus wahren Cartilagine praeformirten Ossicula Sessamoidea in den Ursprungssenen der Köpfe des Musculus Gastrocnemius bei dem Menschen und bei den Säugethieren.

No. 8. *W. Dybowski*.—Die Gasteropoden-Fauna des Baikal-See's.

Vienna. K. K. Geologische Reichsanstalt,—Jahrbuch, Band 26, No. 2.

Dr. Schneider.—Geologischer Uebericht über den holländisch-Ostindischen Archipel.

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KEENE, H. G. The Fall of the Moghul Empire. Second Edition, 8vo., London, 1876.

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THE EDITOR.

TRUMPP, E. DR. Nának, der Stifter der Sikh-Religion. Pamphlet, 4to. Munich, 1876.

LILIENCRON, FREIHERRN R. v. DR. Ueber den Inhalt der allgemeinen Bildung in der Zeit der Scholastik. Pamphlet, 4to., Munich, 1876.

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POTT, A. F. Ueber die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluss auf die geistige Entwicklung des Menschengeschlechts, von W. von Humboldt, mit erläuternden Anmerkungen und Excursen sowie als Einleitung: Wilhelm von Humboldt und die Sprachwissenschaft. 2 vols, 8vo., Berlin, 1876.

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GOVT. OF BENGAL.

Reports and Official Letters to the Kaitakushi by Horace Capron, Commissioner and Adviser and his Foreign Assistants.

K. KURODA, CHOKUWAN OF KAITAKUSHI, TOKAI, JAPAN.

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Calcutta. Stray Feathers,—Vol. IV, Nos. 4, 5 and 6, 1876.

V. Ball.—Notes on some Birds collected in Sambalpoor and Orissa. W. T. Blanford.—Note on the Synonymy of *Spizalauda*. Capt. G. F. L. Marshall.—A new Indian Iora.

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No. 18. T. Benfey.—Nēdiyams, nodishtha.

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E. Lommel.—Die Interferenz des gebeugten Lichtes. W. Ostwald.—Volumchemische Studien.

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Capt. F. W. Hutton.—On *Peripatus novæ-zealandiæ*. *P. Tascher*.—On the Fecundation of the Egg in the Common Fowl. *Dr. N. Severtzoff*.—The Mammals of Turkestan. *Majör Godwin-Austen*.—Descriptions of supposed new Birds from the Khâsi-Nágá Hill-ranges south of the Brahmaputra River, Assam. *E. J. Miers*.—Note on the Genera *Astacoidea* and *Paranephrops*. *J. Wood-Mason*.—On the Femoral Brushes of the *Mantidæ* and their Function. On the Geographical Distribution of *Schizocephala*, a Genus of *Mantidæ*.

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H. F. Hance.—A New Chinese *Arundinaria*. *Baron F. von Mueller*.—Succinct Notes on the Affinity of the *Plantagineæ*. *J. G. Baker*.—On a Second Collection of Ferns made in Samoa by the Rev. S. J. Whitmee.

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R. Sabine.—On a Method of Measuring the Contour of Electric Waves passing through Telegraph Lines. *A. W. Clayden*.—The Spectra of Indium. *Lecoq de Boisbaudran*.—On the Physical Properties of Gallium.

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New Haven. The American Journal of Science and Arts,—Vol. 12, No. 70, 1876.

J. D. Dana.—On Cephalization, Pt. 5 : Cephalization a fundamental principle in the Development of the System of Animal Life. *J. Murray*.—Sea-bottom Deposits observed during the Cruise of the "Challenger".

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No. 14. *M. Malin* adresse une Note relative au radioscope. *M. J. Henry*.—Découverte de la planète (168), (169).

No. 16. *M. Leduc* transmet une Note concernant les nouvelles méthodes proposées pour la recherche de la position du navire à la mer.

No. 17. *M. A. Abbadie*.—Rapport fait à l'Académie des Sciences sur les travaux de *M. Francis Garnier*, lieutenant de vaisseau.

No. 18. *M. N. Joly*.—Étude sur l'appareil reproducteur des E'phémérides.

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Octobre. *M. Bréal*.—La langue indo-européenne.

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———. Revue des deux Mondes,—Tome 17, Livraison 4 ; Tome 18, Livraison 1.

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Feber et Rieber.—Cicadinos d'Europe.

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BAKER, VALENTINE. *Clouds in the East: Travels and Adventures on the Perso-Turkoman Frontier*. 2nd Ed. revised, 8vo., London, 1876.

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HOWORTH, H. H. *History of the Mongols from the 9th to the 10th Century*. Pt. 1. *The Mongols Proper and the Kalmuks*. Royal 8vo., London, 1876.

KAYE, JOHN WILLIAM, Sir. *Lives of Indian Officers, illustrative of the History of the Civil and Military Service of India*. 3 Volumes, 8vo., London, 1875.

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MALLESON, G. B., Colonel, C. S. I. *An Historical Sketch of the Native States of India in subsidiary alliance with the British Government. With a notice of the Mediatized and Minor States*. 8vo., London, 1875.

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SATAW, ERNEST MASON and ISHIBASHI MASAKATA. *An English-Japanese Dictionary of the Spoken Language*. 8vo., London, 1876.

SAYCE, A. H. *The Principles of Comparative Philology*. 2nd Ed. 8vo., London, 1875.

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WUESTENFELD, F. Das Geographische Wörterbuch des Abu 'Obeid 'Abdallah ben 'Abd el-'Aziz el-Bekrî, Band 2, Hälfte 1. 8vo. Göttingen and Paris, 1876.

PERSIAN BOOKS PURCHASED.

'Imâd-us-Sa'âdat, by Sayyid Ghulâm 'Alî Khân;
Tabaqât-i-Akbarî, by Nizâm-ud-dîn.

[APPENDIX.]

LIST OF MEMBERS
OF THE
ASIATIC SOCIETY OF BENGAL.

ON THE 31ST DECEMBER, 1876.

LIST OF ORDINARY MEMBERS.

The * distinguishes Non-Subscribing, the † Non-Resident Members,
and the ‡ Life-Members.

N. B.—Gentlemen who may have changed their residence, since this list was drawn up, are requested to give intimation of such a change to the *Secretaries*, in order that the necessary alterations may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the Secretaries.

Gentlemen who are proceeding to Europe, with the intention of not returning to India are particularly requested to notify to the *Secretaries*, whether it be their desire to continue as members of the Society, otherwise, in accordance with Rule 40 of the Bye-laws, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.

1860 Dec.	5.	Abdul-Latif Khán Bahádur, Maulawí.	Calcutta
1868 Sept.	2.	†Adam, R. M., Esq.	Agra
1860 July	4.	†Ahmad Khán Bahádur, Sayyid, c. s. i.	Denares
1872 April	3.	†Ahsan-ullah, Nawáb.	Dacca
1860 April	4.	†Aitchison, J. E. T., Esq., M. D.	Jullundur
1866 Jan.	17.	*Allan, Lieut.-Col. A. S.	Europe
1871 June	7.	†Alexander, J. W., Esq.	Darbhanga
1860 Oct.	3.	Amír Alí Khán Bahádur, Nawáb.	Calcutta
1874 June	3.	Amír Alí, Sayyid, Esq.	Calcutta
1865 Jan.	11.	Anderson, Dr. J., F. L. S.	Calcutta
1872 June	5.	†Anderson, A. Esq.	Fatehgarh
1875 June	2.	Apear, J. G., Esq.	Calcutta
1875 Feb.	3.	Armstrong, J., Surg., B. Army.	Calcutta
1871 Sept.	6.	*Atkinson, E. T., Esq., c. s.	Europe [ana.
1869 Feb.	3.	†Attar Singh Bahádur, Sirdár.	Bhadour, Ludi-
•			
1870 Feb.	2.	†Baden-Powell, B. H., Esq., c. s.	Lahore
1873 Aug.	6.	†Badgley, Capt., W. F.	Shillong
1859 Aug.	3.	Balaichand Sinha, Bábu.	Calcutta
1865 Nov.	7.	†Ball, V. Esq., M. A., Geol. Survey.	Geol. S. Office
1860 Nov.	1.	Banerjea, Rev. K. M., LL. D.	Calcutta
1876 June	7.	Baness, J. F., Esq.	Calcutta
1869 Dec.	1.	*Barker, B. A., Esq., M. A.	Europe
1873 March	5.	*Barclay, G. W. W., Esq., M. A.	Europe
1860 July	4.	Batten, G. H. M., Esq., c. s.	Calcutta
1859 May	4.	Bayley, E. C., The Hon. Sir, B. C. S., K. C. S. I.	Calcutta
1873 Feb.	5.	Bayne, R. R., Esq., B. A.	Calcutta
1864 Sept.	7.	†Beames, J., Esq., B. C. S.	Cuttak
1841 April	7.	Beaufort, F. L., Esq., B. C. S.	Europe

Date of Election.			
1876 June	7.	†Behrendt, J., Esq.	Patna
1867 July	3.	Belletty, N. A., Esq.	Calcutta [ces
1862 Oct.		*Bernard, C. E., Esq., c. s.	Central Provin-
1872 Aug.	7.	Beverley, H., Esq., c. s.	Calcutta
1876 Nov.	15.	†Beveridge, H., Esq., c. s.	Rangpur
*1864 Nov.	2.	Bhudéva Mukerjea, Bábu.	Chinsurah
1874 Nov.	4.	Bhagabati Charn Mallik, Bábu.	Calcutta
1875 July	7.	†Black, F. C., Esq.	Hamirpur
1873 Dec.	3.	Blackburn, J., Esq.	Calcutta
1857 Mar.	4.	Blanford, H. F., Esq., A. R. S. M., F. G. S.	Calcutta
1859 Aug.	3.	†Blanford, W. T., A. R. S. M., F. R. S., F. G. S.	Geol. S. Office
1873 Aug.	6.	†Bligh, W. G., Esq.	Mathurá
1873 April	2.	†Blissett, T., Esq.	Dacca
1864 April	6.	Blochmann, H., Esq., M. A.	Calcutta
1876 Nov.	15.	†Bowie, Major, M. M.	Sambhalpur
1868 Jan.	15.	†Boxwell, J., Esq., c. s.	Dumka
1876 May	4.	†Bradshaw, A., Surgeon Major.	Simla
1860 March	7.	†Brandis, Dr. D.	Simla
1872 June		*Brooks, W. E., Esq., c. E.	Europe
1871 Jan.		Brough, R. S., Esq.	Calcutta
1866 Nov.		†Browne, Col. Horace A.	Rangoon
1874 April		Bruce, W. D., Esq., c. E.	Calcutta
1871 Sept.		†Buckle, H., Esq.	N. Arracan
1869 Jan.	20.	†Cadell, A., Esq., B. A., C. S.	Banda
1863 June	3.	*Campbell, Sir G., K. C. S. I.	Europe
1873 Mar.	5.	†Cappel, A., Esq.	Simla
1876 Aug.	2.	†Carnegy, T. P., Esq.	Assam
1860 Jan.	3.	†Carnac, J. H. Rivett, Esq., B. C. S.	Ghazipur
1876 Nov.	15.	Cayley, H. Dr.	Calcutta
1875 April	4.	Chambers, Dr. E. W.	Calcutta
1868 Aug.	-	†Chandramohan Gosvámi, Pandit.	Gaubhatti
1872 Dec.		†Chard, Rev. C. H.	Thayetmyo
1874 Aug.		†Chennell, A. W., Esq., Topl. Survey.	Shillong
1875 June		†Chennell, T., Esq.	Dibrúghar
1871 Sept.		†Chisholm, R. F., Esq.	Bombay
1868 Feb.	* 5.	†Clark, Lieut.-Col. E. G., Bengal Staff Corps	Kheri, Oudh
1872 Aug.	7.	*Clutterbuck, Capt. F. St. Quintin.	Europe
1874 Nov.	4.	†Constable, A., Esq.	Lucknow
1876 Mar.	1.	Crawford, J., Esq., c. s.	Calcutta
1868 Dec.	2.	†Cooke, J. E., Esq.	Madras
1876 April	5.	†Coxhead, T. E., Esq.	Tipeeah
1874 March	4.	†Crombie, A., Esq., M. D.	Rangoon
1873 Aug.	6.	Cunningham, D. D., Esq., M. B.	Calcutta
1874 July	1.	*Cowan, Capt. S. H., B. S. C.	Arrah
1847 June	2.	*Dalton, Col. E. T., C. S. I., Staff Corps.	Europe
1870 May	4.	†Damant, G. H., Esq., c. s.	Caehar

Date of Election.			
1873 Dec.	3.	†Dames, M. L., Esq., C. S.	DeraGhaziKhan
1871 Jan.	4.	†Daukes, F. C., Esq., C. S.	Calcutta
1861 Nov.	6.	†Davies, The Hon'ble R. H., C. S. I., B. C. S.	Lahore
1869 April	7.	*Day, Dr. F., F. L. S., F. Z. S.	Europe
1856 June	4.	†DeBourbel, Major R., Royal Engrs.	Lucknow
1874 July	1.	Deane, Capt. T.	Calcutta
1870 Feb.	2.	†DeFabeck, F. W. A., Esq., I. M. Service	Deoli
1872 Aug.	7.	Dejoux, P., Esq.	Calcutta
1869 Oct.	6.	†Delmerick, J. G., Esq.	Delhi
1873 Jan.	8.	†Dennys, H. L., Esq.	Sanbhalpur
1864 July	6.	Devendra Mallik, Bábu.	Calcutta
1862 May	7.	†Dhanapati Singh Dughar, Rái Bahádúr.	Azimganj
1853 Sept.	7.	Dickens, Col. C. H., R. A., C. S. I.	Calcutta
1870 May	4.	†Dobson, G. E., Esq., B. A., M. B., F. L. S.	Europe
1875 March	3.	Dodgson, Walter, Esq.	Calcutta
1859 Sept.	7.	†Douglas, Col. C., R. A.	Lucknow
1875 March	3.	Douglas, J., Esq., Govt. Telg. Dept.	Calcutta
1874 July	1.	Drummond, Col. H., R. E.	Calcutta
1867 June	5.	†Duthoit, W., Esq., C. S.	Mirzapur
1871 March	1.	Dvijendranath Thakur, Bábu.	Calcutta
1870 March	8.	†Edinburgh, H. R. H. The Duke of.	Europe
1863 May	6.	†Edgar, J. W., Esq., C. S. I., B. C.	Darjiling
1874 Dec.	2.	†Egerton, The Hon. R. E., C. S., C.	Lahore
1871 Dec.		Elliot, J., Esq., M. A.	Calcutta
1846 Jan.		*Elliot, Sir Walter, late M. C. S.	Europe
1859 Nov.		*Elliot, C. A., Esq., B. C. S.	Europe
1871 Oct.		†Evezard, Col. G. E.	Púna
1863 Oct.		*Ewart, J., Esq., M. D.	Europe
1859 Dec.	7.	Fath Ali, Maulawí,	Calcutta
1851 May	7.	*Fayrer, Sir J., K. C. S. I.	Europe
1863 Jan.	15.	†Fedden, Francis, Esq., Geol. Survey.	Karáchi
1876 Jan.	5.	Feistmantel, O., Esq. M. D., Geol. Survey.	Calcutta
1876 July	5.	†Foulkes, The Rev. Thos.	Bangalore
1868 May	6.	†Field, C. D., Esq., M. A., C. S.	Burdwan
1869 Sept.	1.	†Fisher, J. H., Esq., C. S.	Chidwara
1872 Dec.	4.	*Forbes, Major J. G., R. E.	Arrah
1875 Jan.	6.	†Forbes, Capt. C. J. F. S., Depy. Comr.	Shwegyeen, B.
1861 Feb.	6.	†Forest, R., Esq., C. E.	Delhra [Burmah
1869 Oct.	12.	*Forlong, Lieut.-Col. J. G. R., M. S. C.	Europe
1863 June	3.	*Forsyth, Sir T. D., K. C. S. I., C. B.	Europe
1871 Nov.	1.	†Foster, J. M., Esq., M. R. C. P.	Nazira, Assam
1873 July	2.	†Fraser, Capt. E.	Bushire
1869 Sept.	1.	*Fryer, Major G. E.	Europe
1867 Sept.	4.	Fyfe, The Rev. W. C.	Calcutta
1873 Dec.	3.	†Gamble, J. S., Esq.	Pankabari, Darjiling

Date of Election.

1871 Aug.	2.	†Gangaprasad, Munshi.	Moradabad
1874 July	1.	†Gardner, D. M., Esq.	Azamgarh
1859 Aug.	3.	†Gastrell, Col. J. E.	Europe
1862 Feb.	5.	†Gaurdās Baisák, Bábu.	Birbhum
1867 Sept.	4.	†Gauvain, Capt. V.	
1867 Dec.	4.	*Gay, E. Esq., M. A.	Europe
1859 Sept.	7.	*Geoghegan, J. Esq., B. C. S.	Europe
1875 July	7.	†Girdlestone, C. E. R., Esq., C. S.	Nepal
1869 Feb.	3.	†Giriprasád Singh, Thákur.	Allighar
1861 Feb.	6.	Godwin-Austen, Major H. H., F. Z. S. F. R. G. S., Topographical Survey.	Calcutta
1872 Nov.	6.	Gordon, C. B. P., Esq.	Calcutta
1862 July	2.	†Gordon, Robert, Esq., C. E.	Henzada
1869 July	7.	†Gordon, J. D., Esq., C. S. I., C. S.	Bangalore
1875 July	7.	†Gouldsbury, J. R. E., Esq.	Montgomery
1863 Nov.	4.	†Gowan, Lieut.-Col. J. Y.	Europe
1866 June	6.	Gribble, T. W., Esq., B. C. S.	Calcutta
1876 Nov.	15.	Grierson, G. A., Esq., C. S.	Rangpur [jab
1861 Sept.	4.	†Griffin, L. H., Esq., B. C. S.	Kapúrthala, Pan-
1873 Aug.	6.	Girischandra Sinha, Rajah.	Calcutta
1861 Feb.	6.	†Growse, F. S., Esq., M. A., B. C. S.	Mathurá
1871 Jan.	4.	Gunendranath Thákur, Bábu.	Calcutta
Jan.	6.	*Gunn, J. S., Esq., M. B., Surg., Bengal Army	Europe
1864 Dec.		†Gurucharan Dás, Bábu.	Krishnagar
1871 June	7.	Habíburrahmán, Maulavi.	Calcutta
1867 July	3.	†Hacket, C. A., Esq., Geol. Survey.	Geol. S. Office
1869 April	3.	*Hæberlin, The Rev. C.	Europe [singh
1861 March	1.	†Harachandra Chaudhuri, Bábu.	Sherpur, Maiman-
1861 Feb.	2.	†Harrison, A. S., Esq., B. A.	Allahabad
1859 Oct.	6.	*Haughton, Col. J. C., C. S. I.	Europe
1874 Jan.	7.	Heintze, C., Esq.	Calcutta [ná
1875 March	3.	†Hendley, Dr. T. H.	Jaipur, Rájputá-
1875 Aug.	4.	†Hewitt, J. F. H., Esq., C. S.	Motibari
1868 Aug.	5.	†Hobart, R. T., Esq., C. S.	Allahabad
1872 Dec.	4.	*Hoernle, Rev. A. F., PH. D.	Europe
1868 Nov.	4.	†Holroyd, Major W. R. M.	Lahore
1873 Jan.	8.	†Houston, G. L., Esq., F. G. S.	Europe
1863 Jan.	15.	†Howell, M. S., Esq., C. S.	Bulandshahr
1866 Feb.	7.	Hoyle, G. W., Esq.	Calcutta
1867 Aug.	7.	†Hughes, T. H., Esq., A. R. S. M., F. G. S.	Geol. S. Office
1873 March	5.	†Hughes, A. J., Esq., C. E.	Barfackpur
1866 Jan.	17.	†Hughes, Captain W. G., M. S. C.	Arracan
1870 Jan.	5.	†Hume, Allan O., Esq., C. B., C. S.	Rajputana
1870 June	1.	*Hunter, W. W., Esq., LL. D., C. S.	Europe
1868 April	1.	*Hyde, Col. H., R. E.	Europe
1872 Dec.	4.	†Ibbetson, D. C. J., Esq., C. S.	Karnál, Panjáb

Date of Election

1866 March 7.	†Irvine, W., Esq., C. S.	Fatehgarh.
1871 March 8.	Isaac, T. S., Esq., C. E.	Calcutta
1853 Dec. 7.	†Isvariprasād Singh Bahádur, Raja.	Benares
1874 Feb. 4.	†Jackson, Dr. C. J.	Muzaffarpur
1876 July	Jarad, Lieut. F. W., R. N.	Calcutta
1865 June	†Jaykissen Dás Bahádur, Rájá, C. S. I.	Cawnpore
1873 Aug.	Jogeshachandra Datta, Bábu.	Calcutta
1866 Feb.	†Johnson, W. H., Esq.	Patna
1862 March 5.	*Johnstone, Major J. W. II.	Europe
1867 Dec. 4.	*Johnstone, Lt. Col. J.	Almora
1873 Dec. 3.	†Johore, H. H., Maharaja of, K. C. S. I.,	New Johore,
		Singapore
1873 April 2.	*Jones, F., Esq., C. S.	Europe
1875 Nov. 3.	†Jones, S. S., Esq., B. A., C. S.	Sasseran
1869 April 7.	Kabiruddín Ahmad, Maulawí.	Calcutta
1871 May 3.	Káliprasanna Ghosh, Bábu.	Calcutta
1861 Dec. 4.	†Kempson, M., Esq., M. A.	Allahabad
1875 April 7.	†Kerr, Ralph, Major, Lord.	Mathura
1874 Dec. 2.	†Khudábakhsh Khán, Maulawí.	Patna
1867 Dec. 4.	King, G., Esq., M. B.	Calcutta
1867 March 6.	†King, Capt. H. W.	P. & O. Co.'s Office
1862 Jan. 15.	King, W., Jr., Esq., Geol. Survey of India.	Geol. Surv. Office
1875 Dec. 1.	Knight, J. B., Esq.	Calcutta
1876 April 5.	Kantichandra Sing, Kumara.	Calcutta
1860 May 5.	Kurz, S., Esq.	Calcutta
1859 Dec. 7.	*Leonard, H., Esq., M. A., C. E.	Europe
1870 July 6.	†Lethbridge, E., Esq., M. A.	Krishnagar
1869 June 2.	*Leupolt, J. C., Esq., C. S.	Europe
1873 Feb. 5.	Lewis, T. R., Esq., M. B.	Calcutta
1864 Nov. 2.	Locke, H. II., Esq.	Calcutta
1866 Jan. 17.	†Low, J., Esq., G. T. Survey.	B. Burmah
1869 July 7.	Lyall, C. J., Esq., B. A., C. S.	Calcutta
1876 May 4.	Lyall, John M., Esq.	Calcutta
1875 Jan. 6.	Lydekker, R., Esq., Geol. Survey of India.	Calcutta
1870 April 6.	†Lyman, B. Smith, Esq.	Japan
1866 June 6.	Macdonald, Lieut.-Col. J., B. S. C.	Calcutta
1876 Dec. 6.	†Macdonald, J. C., Esq.	N. W. P. Terai
1873 May 7.	*Mackay, W., Esq., C. E.	Europe
1873 Dec. 3.	McLeod, K., Esq., M. D.	Europe
1848 April 5.	†Maclagan, Major-General R., R. M., F. R.	
	S. E., F. R. G. S.	Lahore
1867 July 3.	*Macnamara, Dr. C.	Europe
1868 Dec. 2.	†Macauliffe, M., Esq., C. S.	Jhelum
1874 Jan. 7.	†Magrath, C. F., Esq., C. S.	Bogra

Date of Election.

1867 April 3.	Mahendralál Sirkár, Dr.	Calcutta
1867 April 3.	Mainwaring, Lieut.-Col. G. B.	Calcutta
1876 Dec. 6.	Malleson, Col. G. B., c. s.	Calcutta
1852 Nov. 3.	Manickjee Rustamjee, Esq.	Calcutta
1872 Nov. 6.	†Man, E. H., Esq.	Port Blair
1869 July 7.	†Markham, A. M., Esq., c. s.	Allahabad
1874 Aug. 5.	*Marsh, Capt. H. C.	Europe
1873 July 2.	†Marshall, C. W., Esq.	Berhampur
1873 Aug. 6.	†Marshall, Lieut.-Col. W. E.	Simla
1875 April 4.	McConnell, Dr. J. F. P., Prof. Med. Coll	Calcutta
1876 Jan. 5.	†McGregor, W., Esq., Supt. I. Telegraph.	Akyab
1860 March 7.	†Medlicott, H. B., Esq., M. A., F. G. S. Supt Geol. Survey.	Calcutta
1871 Sept.	†Miles, Major S. B.	Muskat
1870 July	*Miller, A. B., Esq.	Europe
1874 May	†Minchin, F. J. V., Esq.	Aska, Ganjam
1875 Aug.	†Minchin, Lieut.-Col. C. C.	Bahawalpur
1876 Dec.	†Mockler, Capt. E., Pol. Agent.	Gwadur
1874 July	†Molesworth, W. G., Esq., c. s.	Simla
1867 March 6.	*Montgomerie, Major T. G., B. E.	Europe
1854 Dec. 6.	Morris, The Hon'ble G. G., B. C. S.	Calcutta
1854 Oct. 11.	*Muir, Sir W., K. C. S. I., B. C. S.	Europe
1862 July 2.	*Napier of Magdala, Baron, General, G. C. S. I., G. C. B.	Europe
1876 May 4.	Nash, A. M., Esq.	Calcutta
1865 Feb. 1.	Nevill, G., Esq., C. M. Z. S.	Calcutta
1871 Jan. 4.	*Newton, Isaac, Esq.	Europe
1872 May 1.	†Niranjan Mukerji, Bábu.	Benaras
1869 July 7.	†Nursing Rao, A. V., Esq.	Vizagapatam
1871 July 5.	†Oates, E. W., Esq., c. s.	Pegu
1874 Oct. 4.	O'Kinealy, J., Esq., c. s.	Calcutta
1851 June 4.	*Oldham, T., Esq., L.L. D., F. R. S.	Europe
1873 Aug. 6.	Olpherts, W. J., Esq.	Calcutta
1864 March 2.	Palmer, Dr. W. J.	Calcutta
1873 Aug. 6.	Parker, J. C., Esq.	Calcutta
1876 June 7.	Parry, R., Esq.	Calcutta
1862 May. 7.	†Partridge, S. B., Esq., M. D.	Europe
1871 Dec. 6.	†Peal, S. E., Esq.	Sibsagar, Assam
1867 March 6.	†Pearinohan Mukerji, Bábu, M. A.	Uttarpara
1860 Feb. 1.	*Pearse, Lieut.-Col. G. G.	Europe
1868 Nov. 4.	†Pearson, C. E., Esq., M. A.	Rawul Pindee
1873 Aug. 6.	*Pedler, A., Esq.	Calcutta
1869 July 7.	Pell, S., Esq.	Calcutta
1864 March 2.	†Pellew, F. H., Esq., c. s.	Hooghly
1865 Sept. 6.	†Peppé, T. E., Esq.	Ranchi

Date of Election		
1868 May	6.	Peterson, F. W., Esq.
1835 July	1.	†Phayre, Major-G., Sir A. P., K. C. S. I., C. B.
1864 Nov.	2.	*Phear, The Hon'ble J. B.
1869 Feb.	3.	†Pickford, J., Esq., M. A.
1875 Feb.	3.	†Porter, W. J., Esq.
1868 April	1.	†Pranathanáth Ráy, Raja.
1872 Dec.	4.	Pranáth Sarasvati Pandit, M. A., B. L.
1869 Feb.	3.	Pratápachandra Ghosha, Bábu, B. A.
1874 Dec.	2.	†Protheroe, Capt. M.
1856 Mar.	5.	Rájendralála Mitra, Bábu, Raí Bahádur LL.D.
1871 June	7.	Rámakrishna Dás, Bábu.
1837 Feb.	1.	Rámanáth Tagor, The Hon. Mahárájá, C. S. I.
1874 Dec.	2.	†Rám Dás Sen, Bábu.
1876 July	5.	Raye, D. O'Connell, Esq., M. D.
1860 Mar.	7.	†Reid, H. S., Esq., C. S.
1871 July	5.	†Reid, J. R., Esq., C. S.
1872 April	3.	†Richards, Dr. V.
1868 April	1.	Robb, G., Esq.
1863 April	1.	†Robertson, C., Esq., C. S.
1874 May	6.	*Robinson, Col. D. G., R. E.
1865 Feb.	1.	Robinson, S. H., Esq.
1876 Dec.	6.	†Rodon, Lieut. G. S., Royal Scots.
1870 Jan.	5.	*Ross, Alexander G., Capt., Staff Corps.
1871 Dec.	6.	*Samuells, Capt. W. L., B. S. C.
1872 Feb.	7.	†Sashagiri Sastri, M., B. A.
1870 May	4.	Satyánand Ghoshál, Rájá.
1873 Jan.	8.	Schlegel, F., Esq.
1870 May	4.	†Schlich, Dr. W.
1869 Feb.	3.	*Schwendler, L., Esq.
1876 July	5.	†Scott, D., Esq., C. E.
1876 July	5.	†Scott, R., Esq., C. S.
1874 July	1.	†Scully, Dr. J.
1876 Feb.	2.	†Shaw, R. B., Esq.
1860 July	4.	†Shelverton, G., Esq.
1863 April	1.	†Showers, Lieut.-Col. C. L.
1872 Aug.	7.	†Skrefsrud, Rev. L. O.
1864 Sept.	7.	†Sladen, Lieut.-Col. E. B.
1875 Feb.	3.	*Smidt, J., Esq.
1865 July	5.	Smith, D. Boyes, Esq., M. D.
1874 June	3.	†Smith, V. A., Esq., C. S.
1864 Mar.	2.	†Spearman, Capt. H. R.
		Calcutta
		Mauritius
		Europe
		Madras
		Shwegyeen, B.
		Burmah
		Digapati
		Bhawanipur
		Calcutta
		Port Blair
		Calcutta
		Calcutta
		Calcutta
		Berhampur
		Calcutta
		Allahabad
		Azimghar
		Goalundo
		Calcutta
		Mirzapur
		Europe
		Calcutta
		Ranikhet
		Europe
		Europe
		Madras
		Calcutta
		Calcutta
		Darjiling
		Europe
		Cuttak
		Muzaffarnagur
		Nepál [mir
		(Ladak) Kash-
		Waltair, near
		Vizagapatam
		Amballa
		Santhal Mission
		Rampur Haut
		Arracan
		Europe
		Calcutta
		Hamirpur
		Amherst

Date of Election.			
1872 July	3.	†Stephen, Carr, Esq.	Ludianah
1863 Sept.	2.	†Stewart, R. D., Esq.	Raniganj
1875 July	7.	*Stewart, M. G., Esq.	Europe
1876 Aug.	2.	†St. John, Major O. B., R. E.	Ajmir, Mayo College
1861 Sept.	4.	Stokeſ, Whitley, Esq., C. S. I.	Calcutta
1869 Feb.	3.	Strachey, The Hon'ble Sir J., K. C. S. I.	Calcutta
1859 Mar.	2.	Stubbs, Lieut.-Col. F. W., Royal Artillery.	Ishapur near Barrackpur
1858 July	7.	†Sutherland, H. C., Esq., B. C. S.	Backergunge
1864 Aug.	11.	Swinhoe, W., Esq.	Calcutta
1865 Sept.	6.	*Tawney, C. H., Esq., M. A.	Europe
1865 April	5.	Taylor, R., Esq., C. S.	Calcutta
1874 Mar.	4.	Taylor, Commander A. D., late Indian Navy.	Calcutta
1860 May	2.	†Temple, The Hon. Sir R., Bart., K. C. S. I., B. C. S.	Bombay
1876 Feb.	2.	Tennant, Col. J. F., R. E., F. R. S.	Calcutta
1875 June	2.	†Thibaut, Dr. G.	Benares
1869 Oct.	6.	†Thomson, A., Esq.	Faizabad
1875 Nov.	3.	†Thomson, R. G., Esq., C. S.	Sirsa
1847 June	2.	Thuillier, Col. H. L., R. A., C. S. I., F. R. S.	Calcutta
1865 July	5.	*Tolbort, T. W. H., Esq., C. S.	Europe
1871 April	5.	*Treffitz, Oscar, Esq.	Europe
1861 June	5.	†Tremlett, J. D., Esq., M. A., C. S.	Muzaffargarh
1872 July	3.	†Trevor, W. S., Lieut.-Col., R. E.	Indor
1873 April	2.	Turnbull, R., Esq.	Calcutta
1863 May	6.	†Tyler, J. W., Esq., M. D.	Agra
1869 June	2.	†Udaychand Dutt, Bábu.	Faridpur
1873 April	2.	Umesh Chunder Dutt, Bábu.	Calcutta
1860 May	2.	*Vanrenen, Lieut. Col. A. D., B. C. S.	Calcutta
1864 Feb.	3.	†Verchère, A. M., Esq., M. D.	Agra
1864 April	6.	†Vijayarâma Gujapati Raj Munniâ Sultân Bahâdur, Mahârâjah Mirza Vijayana-gram.	Benares
1870 June	1.	†Vrindâvanachandra Mandala, Bábu.	Balasor
1871 Feb.	1.	*Waagen, Dr. W., Geological Survey.	Europe
1869 Aug.	4.	Wâhid Alî, Prince Jahân Qadr Muham-mad Bahâdur.	Garden Reach
1865 Nov.	1.	Waldie, D., Esq., F. G. S.	Calcutta
1861 May	1.	*Walker, Col. J. T., R. E., F. R. S.	Europe
1875 April	7.	Wall, Dr. A. J., B. Medical Service.	Calcutta
1863 Oct.	7.	Waller, W. K., Esq., M. B.	Calcutta
1865 May	3.	Waterhouse, Capt. J., B. S. C.	Calcutta

Date of Election.

1874 July	Watt, Dr. George.	Hughli
1876 Dec.	Webb, W. T., Esq., M. A.	Calcutta
1869 Sept.	*Westland, J., Esq., C. S.	Europe
1867 Feb.	†Westmacott, E. V., Esq., B. A., C. S.	Dinajpur
1862 Oct.	Wheeler, J. T., Esq.	Calcutta
1873 April	†White, E., Esq., C. S.	• Bijour
1875 Feb.	†Whiteway, R. S., Esq., C. S.	Muttra
1867 Aug.	†Wileox, F., Esq.	Purulia
1873 May 7.	†Williams, G. R. C., Esq., C. S.	Banda
1867 Jan. 16.	†Williamson, Capt. W. J.	Garo Hills
1876 April 5.	Wilson, Alexander, Esq.	Calcutta
1870 Aug. 3.	Wilson, R. H., Esq., C. S.	Calcutta
1866 Mar. 7.	*Wise, Dr. J. F. N.	Europe
1867 July 3.	†Wood, Dr. J. J.	Ranchi
1874 Mar. 4.	Wood, C. H., Esq.	Calcutta
1870 Jan. 5.	Wood-Mason, J., Esq., Indian Museum.	Calcutta
1873 Aug. 6.	†Woodthorpe, Lieut. R. G., R. E.	Naga Hills
1869 Sept. 1.	Yadulál Mallik, Bábu.	Calcutta
1868 June 3.	Yatindramohana Tagore, The Hon'ble Maharaja.	Calcutta
1867 Mar. 6.	†Yogendranáth Mallik, Bábu.	Andul

HONORARY MEMBERS.

1825 Mar. 9.	M. Garcin de Tassy, Memb. de l'Institut.	Paris
1821 " 6.	Sir John Phillippart.	London
1826 July 1.	Count de Noc.	Paris
1835 May 6.	Professor Isaac Lea.	Philadelphia
1847 Sept. 1.	Col. W. Munro.	London
1847 Nov. 3.	His Highness the Nawab Nazim of Bengal.	Murshidabad
1848 Feb. 2.	Dr. J. D. Hooker.	Kew
1848 Mar. 8.	Professor Henry.	Princeton, U. S.
1853 April 6.	Major-Gen. Sir H. C. Rawlinson, K. C. B.	London
1858 July 6.	R. H. Hodgson.	Europe
1859 Mar. 2.	The Hon'ble Sir J. W. Colville, Kt.	Europe
1860 " 7.	Professor Max Müller.	Oxford
1860 Nov. 7.	Monsieur Stanislas Julien.	Paris
1860 " 7.	Edward Thomas.	London
1860 " 7.	Dr. Aloys Sprenger.	• Bern
1860 " 7.	Dr. Albrecht Weber.	Berlin
1868 Feb. 5.	General A. Cunningham, C. S. I.	India
1868 " 5.	Professor Bápu Déva Sástri.	Benares
1868 " 5.	Dr. T. Thomson.	London
1868 " 2.	A. Grote.	London
1871 " 7.	Charles Darwin.	London

Date of Election.			
1872 Feb.	1.	Sir G. B. Airy.	London
1872 June	5.	Professor T. H. Huxley.	London
1875 Nov.	3.	Dr. O. Böttlingk.	Jena
1875 „	3.	Professor J. O. Westwood.	Oxford
1876 April	5.	Yule, Col. H., R. E., C. B.	London
1876 „	5.	Siemens, Dr. Werner.	Berlin

CORRESPONDING MEMBERS.

1844 Oct.	2.	Macgowan, Dr. J.	Europe
1856 June	4.	Krämer, Herr A. von.	Alexandria
1856 „	3.	Porter, Rev. J.	Damascus
1856 „	4.	Schlagintweit, Herr H. von.	Munich
1856 „	4.	Smith, Dr. E.	Beyrout
1859 „	4.	Taylor, J., Esq.	Bussorah
1857 Mar.	4.	Nietner, J. Esq.	Ceylon
1858 „	3.	Schlagintweit, Herr R. von.	Giessen
1859 Nov.	2.	Frederick, Dr. H.	Batavia
1859 May	4.	Bleeker, Dr. H.	Europe
1860 Feb.	1.	Baker, The Rev. H.	E. Malabar
1860 „	1.	Swinhoe, R., Esq., H. M.'s Consul.	Anioy
1861 July	3.	Gösche, Dr. R.	
1862 Mar.	5.	Murray, A., Esq.	London
1863 July	4.	Barnes, R. H., Esq.	Ceylon
1866 May	7.	Schlagintweit, Prof. E. von.	Munich
1866 „	7.	Sherring, Rev. M. A.	Benares
1868 „	5.	Holmböe, Prof.	Christiania

ASSOCIATE MEMBERS.

1865 May	3.	Dall, Rev. C. H.	Calcutta
1874 Feb.	4.	Schaumburgh, J., Esq.	Calcutta
1874 April	1.	Lafont, Rev. F. E., s. J.	Calcutta
1875 Dec.	1.	Bate, Rev. J. D.	Allahabad
1875 „	1.	Maulawī Abdul Hai, Madrasah.	Calcutta

LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.*

**Rule 40.*—After the lapse of 3 years from the date of a Member leaving India, if no intimation of his wishes, shall, in the interval have been received by the Society his name shall be removed from the list of Members.

The following Members will be removed from the Member List of the Society under the operation of the above ~~Rule~~ Rule.

	Date of leaving India.
Clutterbuck, Capt. F. St. Quintin,.....	January 1873.
Gauvain, Capt. V.,	July 1873.
Haeberlin, the Rev. C.,	August 1873.
Pearson, C. E., Esq., M. A.,	January 1874.

LOSS OF MEMBERS DURING 1876.

BY RETIREMENT.

C. Macnaghten, Esq.	Rajkot College.
W. Bourne, Esq.	Calcutta.
G. E. Knox, Esq.	Banda.
Major H. H. Mallock.	Calcutta.
Lieut. H. B. Urmston.	Panjab.
W. Theobald, Esq.	Calcutta.
H. C. Williams, Esq.	Chanda.
A. Tween, Esq.	Calcutta.
R. Stewart, Esq.	Calcutta.
T. B. Mitchell, Esq.	Assam.
Raja Harendra Krishna Bahadur.	Calcutta.
J. Wilson, Esq.	Bankipur.
C. T. Buckland, Esq.	Calcutta.
Capt. E. N. D. La Touche.	Assam.
Capt. C. S. Pratt.	Europe.
J. Hector, Esq.	Calcutta.
R. A. Carrington, Esq.	Calcutta.

BY DEATH.

Ordinary Members.

Butler, Capt. J., B. S. C.	Samaguting.
Willson, W. G., Esq.	Calcutta.
Atkinson, W. S., Esq., M. A.	Europe.
Heeley, W. L., Esq., B. A., C. S.	Europe.
Brown, R., Esq., M. D.	Manipur.
Milman, R., D. D., the Right Rev., Lord Bishop of Calcutta.	Calcutta.

Honorary Members.

Prof. C. Lassen.	Bonn.
Prof. Jules Mohl.	Paris.
Dr. Robert Wight, (<i>died in 1873.</i>)	London.

Corresponding Members.

Haug, Dr. M.	Munich.
Foucaux, M. F. H.	Paris.

[APPENDIX.]

ABSTRACT STATEMENT
OF
RECEIPTS AND DISBURSEMENTS
OF THE
ASIATIC SOCIETY OF BENGAL
FOR
THE YEAR 1876.

STATEMENT, *Abstract of the Cash Account*

RECEIPTS.				1876.	1875.
BALANCE OF 1875.					
In the Bank of Bengal, <i>viz.</i>					
Account of Stoliczka Memorial Fund, ..	Rs.	812	5 2		
Account of Asiatic Society of Bengal, ..	..	3,015	13 1		
			3,858 2 3		
Cash in hand, ..	..		160 9 4		
				4,018	11 7
ADMISSION FEES.					
Received from Members, ..	..	800	0 0		
				800	0 0
				930	0 0
SUBSCRIPTIONS.					
Received from Members, ..	..	9,009	1 9		
				9,009	1 2
				9,760	15 0
PUBLICATIONS.					
Sale proceeds of Journal and Proceedings, ..	..	409	0 0		
Subscription to ditto, ..	..	1,056	0 0		
Refund of Postage Stamps, ..	..	15	14 6		
Ditto of Printing charges, ..	..	54	9 6		
				1,535	8 0
				1,729	10 0
LIBRARY.					
Sale proceeds of Books, ..	..	280	3 0		
Refund of Freight, ..	..	23	12 0		
Ditto of Postage ..	..	8	10 6		
				312	9 6
				411	14 0
SECRETARY'S OFFICE.					
Saving of Salary, ..	..	36	5 3		
Received fine, &c., ..	..	2	8 3		
Ditto Commission on Purchase of Stamps, ..	..	6	9 9		
Sale proceeds of two Wooden Casks, ..	..	1	11 0		
Refund of Cart and Cooley hire, ..	..	13	6 0		
				60	8 3
				24	15 6
VESTED FUND.					
Received from the Secretary of State for India on account of abandonment by the Society of all claims to accommodation in the New Museum building, ..	..	1,50,000	0 0		
Interest on the Government Securities from the Bank of Bengal, ..	..	8,573	0 0		
Sale proceeds of 5½ per cent. Government Securities Nos. 043894, 043518, 189, 60, ..	..	5,000	0 0		
Carried over Rs.		1,63,573	0 0	15,736	7 1

No. 1.

of the Asiatic Society for 1876.

DISBURSEMENTS.

PUBLICATIONS.			1876.	1875.
Paid Freight for sending Journal and Proceedings,	168	9	0	
Ditto Lithographing and Engraving charges, &c.,	1,605	11	0	
Ditto Printing charges,	5,381	9	6	
Ditto Commission on Collecting Bills, ..	3	4	3	
Ditto Purchase of Postage Stamps, ..	281	0	0	
Ditto Packing charges,	24	11	0	
Ditto Paper for Plates,	153	6	0	
Ditto Journal Binding,	6	0	0	
Ditto Printing charges for a Catalogue of Mammals and Birds of Burmah for Journal Part II, No. 1 of 1875 (£ 62-4-6 @ 1s. 9d. per rupee),	711	2	3	
Ditto overland carriage on parcels of lithographed Plates, from England, ..	42	2	0	
Ditto Major H. H. Godwin-Austen for printing and coloring Plates of Naga Hill Views, Dafia Shells, &c., ..	499	9	0	
Ditto Petty charges,	16	14	6	
			8,893	14 6 7,373 2 1
LIBRARY.				
Paid Salary of Librarian,	1,800	0	0	
Ditto Establishment,	136	0	0	
Ditto Commission on Collecting Bills, ..	0	1	3	
Ditto Landing charges,	10	3	3	
Ditto Book Binding,	408	2	0	
Ditto Salary of Punkha Bearer,	38	5	3	
Ditto Subscription to the Calcutta Review,	16	0	0	
Ditto ditto to the Medical Gazette, ..	15	0	0	
Ditto ditto to Stray Feathers,	11	0	0	
Ditto Purchase of Books through Messrs. Trübner & Co.,	177	9	6	
Ditto ditto of ditto through Messrs. Friedlander and Sohn,	172	14	6	
Ditto ditto of ditto in Calcutta,	306	9	2	
	657	1	2	
Ditto repairing glass cases,	23	0	0	
Ditto Freight,	5	1	5	
Ditto Insufficient and Bearing Postage, ..	3	1	0	
Ditto a Teakwood Double Ladder,	12	0	0	
Ditto Petty charges,	26	8	3	
			3,161	7 7 4,475 6 6
SECRETARY'S OFFICE.				
Paid General Establishment,	397	8	0	
Ditto Secretary's Establishment,	1,658	0	0	
Ditto Purchase of Postage Stamps,	124	0	0	
Carried over, Ra.	2,179	8	0	12,055 6 1

RECEIPTS.

1876.

1875.

Brought over, Rs.	1,63,673	0	0	15,736	7	1
Interest on ditto from 30th November to 12th December, 1876, being 12 days @ $5\frac{1}{2}$ per cent., ..	9	2	8			
Premium on ditto @ 1-14 per cent., ..	93	12	0			
			<u>102</u>	<u>14</u>	<u>8</u>	
				1,63,675	14	8
				449	0	0

BUILDING.

Received from the Right Hon'ble the Secretary of State for India from 1st December, 1875 to 21st April, 1876, @ Rs. 400 per month, ..	1,920	0	0	1,920	0	0
				4,800	0	0

DR. STOLICZKA MEMORIAL FUND.

Received Subscription to the Fund, ..	181	0	0	181	0	0
				1,350	0	0

PIDDINGTON FUND.

Refund by the Committee of the Chamber of Commerce of the moiety of Subscriptions to the Fund, from the Asiatic Society (Rs. 1,172), ..	586	4	0	586	4	0
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PIDDINGTON PENSION FUND.

Received by Transfer from the Piddington Fund, ..	586	4	0			
Deduct Refund to Capt. W. J. A. Wallace, of half his subscription, ..	8	0	0			
			<u>578</u>	<u>4</u>	<u>0</u>	
Subscription Received from W. T. Blandford, Esq., to the Fund, ..	25	0	0			
Ditto Interest on the Government Security of Rs. 500, ..	27	8	0			
				630	12	0

DR. OLDHAM MEMORIAL FUND.

Received Subscription to the Fund, ..	156	0	0	156	0	0
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MISCELLANEOUS.

Fund Account, ..	1,040	7	6			
O. P. Fund, ..	1,086	5	9			
Conservation of Sanscrit MSS., ..	1,000	0	0			
W. Irvine, Esq., ..	10	12	0			
M. S. Howell, Esq., ..	0	9	0			
Capt. W. L. Samuells, ..	5	13	0			
C. W. Marshall, Esq., ..	3	7	0			
The Rev. C. H. Chard, ..	0	6	0			
J. W. Edgar, Esq., ..	4	11	0			
Money Lal Bysack, ..	67	13	0			
Jadubindo Bysack, ..	493	10	6			
T. W. H. Tolbort, Esq., ..	3	6	0			
Messrs. Trümmer & Co., ..	4	6	6			
Capt. C. J. F. Forbes, ..	5	0	0			
W. W. Hunter, Esq., ..	1	8	0			
L. Schwendler, Esq., ..	9	7	0			
H. Blochmann, Esq., ..	9	0	0			
G. Nevill, Esq., ..	6	11	9			

Carried over, Rs. 3,753 6 0 1,82,886 5 9

DISBURSEMENTS.		1876.	1875.
Brought over, Rs.	2,179 8 0	12,055 6	
Paid Insufficient and Bearing Postage,	4 14 0		
Ditto Meeting charges, ..	128 11 0		
Ditto Commission on Subscription collected,	54 14 3		
Ditto Salary of Mali, ..	72 0 0		
Ditto Printing charges, ..	198 15 6		
Ditto Pension to Islam Khan, ..	36 0 0		
Ditto Fee to the Bank of Bengal for			
Staffing cheques, ..	3 2 0		
Ditto Stationery, ..	58 1 0		
Ditto Binding Letter files, ..	6 13 0		
Ditto Advertising charges, ..	43 0 0		
Ditto Subscription to the Calcutta Di-			
rectory, ..	14 0 0		
Ditto ditto to the Army List, ..	12 0 0		
Ditto Carpenter for open-			
ing and fixing glass cases, 24 14 0			
Ditto ditto for repairing			
Book Shelves, Meeting			
Table, &c., .. 28 2 0			
	53 0 0		
Ditto to the Collector of			
Stamps Revenue of Cal-			
cutta for Stamping the			
Memorandum of Associa-			
tion of the Asiatic Society, 16 0 0			
Ditto Registration fee for			
ditto, .. 50 0 0			
	66 0 0		
Ditto a copy of Indian Postal Guide,	1 0 0		
Ditto Petty charges, ..	65 3 3		
Ditto Ticca Cooley for removing Books			
and Shelves, &c., .. 78 6 0			
		3,075 8 0	3,769 9 9
FURNITURE AND FITTINGS.			
Paid a Teakwood Table for Duflery,	14 0 0		
Ditto three Teakwood Racks,	183 0 0		
Ditto a Teakwood large Glass Case,	253 0 0		
Ditto Repairing and fixing			
Cane Matting in four			
rooms, .. 298 0 0			
Ditto Supplying and fixing			
New Cane Matting, .. 1,146 10 0			
	1,444 10 0		
Ditto a dozen of Teakwood rattan-back			
Arm-chairs, .. 67 4 0			
Ditto a pair six branches Gaselier,	400 0 0		
		2,361 14 0	
VESTED FUND.			
Paid Purchase of 5½ per cent. Govern-			
ment Security through Bank of Bengal, 1,44,800 0 0			
Ditto Interest on ditto, .. 2,716 10 7			
Ditto Premium on ditto, .. 3,025 10 0			
Ditto Commission on ditto, 376 5 6			
Ditto ditto on Collecting Interest			
on Government Securities, .. 21 6 8			
Ditto ditto on Selling Govern-			
ment Security of Rs. 5,000, .. 12 12 1			
Carried over, Rs. 1,50,952 12 10		17,492 12 1	

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RECEIPTS.

					1876.	1875.
	Brought over, Rs.	3,753	6	0	1,82,886	5 9
Dr. G. Thibaut,	27	6	0		
The Hon'ble C. R. Lindsay,	0	11	0		
H. W. Dashwood, Esq., ..	..	0	12	0		
Babullah Duffery, ..	..	10	0	0		
Dr. T. H. Hendley, ..	..	19	10	0		
E. V. Westmacott, Esq., ..	..	3	4	0		
S. Kurz, Esq., ..	..	122	0	0		
C. Grant, Esq., ..	..	0	11	0		
M. L. Dames, Esq., ..	..	0	3	0		
Lt.-Col. J. Burn, ..	..	2	10	0		
The Government North-Western Pro-						
vinces, ..	..	13	8	0		
B. Quaritch, Esq., ..	..	128	14	0		
Lt.-Col. Lord R. Kerr, ..	..	2	0	0		
V. A. Smith, Esq., ..	..	2	7	0		
J. Beames, Esq., ..	..	20	0	0		
F. S. Growse, Esq., ..	..	2	0	0		
H. F. Blanford, Esq., ..	..	3	4	9		
A. S. Harrison, Esq., ..	..	3	0	0		
Col. W. E. Marshall, ..	..	1	15	0		
W. Stokes, Esq., ..	..	1	11	0		
J. G. Delmerick, Esq., ..	..	1	0	0		
Col. H. L. Thuillier, ..	..	0	3	0		
Braj Bhushan Das, ..	..	0	0	3		
The Hon'ble Sir E. C. Bayley, K. C. S. I.,		1	8	0		
					4,122	3 0 2,307 0

Carried over, Rs. 1,87,008 8 9

DISBURSEMENTS.		1876.	1875.
Brought over, Rs.		1,50,952 12 10	17,492 12
Paid ditto Brokerage on ditto	.. ..	6 4 0	
Ditto Fee for renewing Government Securities,	.. ..	3 0 0	
		1,50,962 0 10	4,073 9 8
BUILDING.			
Paid House rate, .. ..	.. ..	372 0 0	
Ditto Police and Lighting rate, ..	.. ..	276 0 0	
Ditto Water rate, .. ..	.. ..	213 13 6	
Ditto making Drawing of the Asiatic Society's Premises, .. ..	.. ..	13 14 0	
Ditto J. B. Norton, Esq., for supplying and fixing Gas Pipes, .. ..	.. ..	762 6 0	
Ditto ditto 96 Jets for ditto ditto with Pipe and Cocks complete in the Meeting room, .. ..	.. ..	401 6 0	
Ditto Messrs. Mackintosh, Burn & Co., in part payment for repairing the Society's Premises, .. ..	.. ..	8,000 0 0	
		10,039 7 6	1,008 12 7
COIN FUND.			
Purchase of Silver Coins, .. ..	.. ..	39 0 0	
Ditto of two Gold Coins, .. ..	.. ..	41 10 0	
Paid Cooley and Cart for bringing a Coin box from the Mint, .. ..	.. ..	0 7 0	
Ditto Banghy Expense for sending a packet of Gold Coins to W. Campbell, Esq., Beerbhoom, .. ..	.. ..	0 4 0	
Ditto fee for getting Money Order, .. ..	.. ..	0 4 0	
Ditto Insufficient Postage on Packet of Gold Coin, .. ..	.. ..	0 4 0	
		81 13 0	376 4 0
DR. OLDHAM MEMORIAL FUND.			
Paid Printing charges, 370 Copies of Circular, .. ..	.. ..	11 0 0	
Ditto Advertising the List of Subscribers to the Fund, .. ..	.. ..	14 8 0	
		25 8 0	
DR. STOLICZKA MEMORIAL FUND.			
Remitted to A. Grote, Esq., London, 3 overland Money Orders Nos. 143 to 145, dated 10th July 1876, @ £ 10 each, ..	.. ..	395 3 3	
Ditto ditto 2 Overland Money Orders Nos. 161 and 162, dated 17th July 1876, @ £ 10 each, .. ..	.. ..	263 7 6	
		658 10 9	1,738 14 4
PIDDINGTON FUND.			
Refunded to Capt. W. J. A. Wallace, being half his Subscription to the above Fund, .. ..	.. ..	8 0 0	
Paid by Transfer to the Piddington Pension Fund, .. ..	.. ..	578 4 0	
		586 4 0	
PIDDINGTON PENSION FUND.			
Paid to the Bank of Bengal for Purchase of 5½ per cent., Government Security No. 047143—021980, of 1859-60, ..	.. ..	500 0 0	
Carried over, Rs.	500 0 0	1,79,846 8 2	

RECEIPTS.	1876.	1875
Brought over, Rs.	1,87,008 8 9	

Carried over, Rs. 1,87,008 8 9

DISBURSEMENTS.

1876.

1875.

Brought over, Rs.	500	0	0	1,79,846	8	2
Paid Interest on ditto from 30th Nov. 1875 to 7th September, 1876, being 9 months, and 7 days @ $5\frac{1}{2}$ per cent., ..	21	2	6			
Ditto Premium on ditto @ $1\frac{1}{2}$ per cent., ..	22	8	0			
Ditto Commission ditto @ $\frac{1}{2}$ per cent., ..	1	5	9			
Refunded to R. Taylor, Esq., half his Subscription to the Fund, ..	15	0	0			
Paid Commission on Collecting Interest on Government Security, ..	0	0	7			
				560	0	10

MISCELLANEOUS.

Paid donation towards a Zoological Exploration of Tenasserim, ..	500	0	0			
Fund Account, ..	1,130	0	0			
O. P. Fund, ..	86	5	9			
Earth Current Account, ..	18	0	0			
Lt.-Col. C. C. Minchin, ..	1	0	0			
J. Beanes, Esq., ..	1	9	0			
Capt. E. Fraser, ..	0	8	0			
M. Macauliffe, Esq., ..	3	12	0			
J. G. Delmerick, Esq., ..	0	10	0			
F. S. Growse, Esq., ..	3	14	0			
Money Lal Bysack, ..	116	11	6			
Jadubindo Bysack, ..	445	12	0			
The Government North Western Provinces, ..	8	5	0			
Major W. R. M. Holroyd, ..	2	4	0			
L. Schwendler, Esq., ..	9	7	0			
G. Nevill, Esq., ..	6	11	9			
Dr. G. Thibaut, ..	26	2	6			
Dr. F. Keilhorn, ..	1	2	0			
J. W. Edgar, Esq., ..	1	15	0			
Dr. T. H. Hendley, ..	19	10	0			
G. H. Damant, Esq., ..	0	12	0			
Capt. C. J. F. S. Forbes, ..	3	12	9			
L. H. Giffin, Esq., ..	1	7	0			
Lt.-Col. J. Burn, ..	50	10	0			
S. Kurz, Esq., ..	122	0	0			
The Hon'ble C. R. Lindsay, ..	0	11	0			
C. Grant, Esq., ..	0	11	0			
H. W. Dashwood, Esq., ..	0	11	0			
Maulavi Syad Jamadali, ..	0	11	0			
M. Sashagiri Sastri, ..	0	11	0			
H. H. the Rao of Kutch, ..	0	11	0			
V. A. Smith, Esq., ..	1	11	0			
Major H. H. Godwin-Austen, ..	2	12	0			
W. Stokes, Esq., ..	1	11	0			
Babullah Duftery, ..	10	0	0			
W. Irvine, Esq., ..	6	9	6			
W. J. Porter, Esq., ..	0	4	0			
Major-General A. Cunningham, C. S. I.,	0	8	0			
The Hon'ble Sir E. C. Bayley, C. S. I.,	1	8	0			
C. J. Lyall, Esq., ..	0	1	0			
W. McGregor, Esq., ..	2	7	6			
C. E. R. Girdlestone, Esq., ..	1	9	0			
The Rev. F. Foulkes, ..	1	2	0			
E. Lethbridge, Esq., ..	0	3	0			
Raja Joykissen Doss, ..	0	3	0			

* Carried over, Rs. 2,597 6 3 1,80,406 9 0

RECEIPTS.	1876.	1875.	•
Brought over, Rs.	1,87,008	8	9

Rs. 1,87,008 8 9

Examined and found correct,

DAVID WALDIE,
H. H. GODWIN-AUSTEN, *Major*.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st, 1877.

DISBURSEMENTS.

1876

1875.

Brought over, Rs.		2,597	6	3	1,80,406	9	0		
Lt.-Col. L. R. Kerr,	0	4	0				
Col. H. L. Thuillier,	0	3	0				
M. L. Dames, Esq.,	0	45	0				
Dr. J. Scully,	2	0	0				
H. F. Blanford, Esq.,	14	5	6				
E. H. Man, Esq.,	0	3	0				
Dr. T. R. Lewis,	0	4	0				
Dr. V. Richards,	0	5	0				
A. S. Harrison, Esq.,	2	10	0				
Md. Khodabux Khan,	0	10	0				
W. T. Blanford, Esq.,	4	6	0				
H. Buckle, Esq.,	0	11	0				
A. Anderson, Esq.,	0	1	0				
R. B. Shaw, Esq.,	9	11	0				
					<hr/>				
					2,633	14	9	1,947	5 4

BALANCE.

In the Bank of Bengal, *viz.*

Account of Stoliczka Memorial Fund, ..	334	10	5
Account of Dr. Oldham Memorial Fund, ..	130	8	0
Account of Piddington Pension Fund, ..	70	11	2
Account of Asiatic Society of Bengal, ...	3,213	13	2

Cash in hand, 3,749 10
218 6

3,968 1 0

Rs. 1,87,008 8 9

Examined and found correct,

DAVID WALDIE,

H. H. GODWIN-AUSTEN, *Major.*

STATEMENT, *Abstract of the Cash Account,*

	RECEIPTS.	1876	1875.
BALANCE OF 1875.			
In the Bank of Bengal, <i>viz.</i>			
Dr. J. Muir, ..	.. 898 10 0		
O. P. Fund, ..	.. 3,364 8 6		
	4,263		
Cash in hand,	144		
		4,407 9 11	
ORIENTAL PUBLICATIONS.			
Received by sale of Bibliotheca Indica, and			
by Subscription to ditto, ..	.. 2,441 11 9		
Ditto Refund of Postage and Packing,	65 9 6		
Ditto Commission on Purchase of Postage Stamps, ..	.. 0 8 0		
		2,507 13 3	2,872 6 3
GOVERNMENT ALLOWANCE.			
Received from General Treasury at 500 Rs. per month, ..			
	6,000 0 0		
Ditto ditto Additional grant for the publication of Sanskrit Works at 250 Rs. per month, ..			
	3,000 0 0		
		9,000 0 0	9,000 0 0
CUSTODY OF ORIENTAL WORKS.			
Saving of Salary, ..	30 6 3		
Ditto Fine, ..	0 8 0		
		30 14 3	2 2 9
Asiatic Society of Bengal, ..	86 5 9		
Babu Braj Bhushana Das, ..	49 10 6		
Basel Mission Book Tract Depository, ..	5 1 0		
T. W. H. Tolbort, Esq., ...	5 14 0		
Babu Pratapa Chandra Ghosha, ..	30 14 3		
Sheoprasad Sadur, ..	2 7 0		
Adhur Sing Gour, ..	0 5 0		
Gopal Rao Hurry, Esq., ..	3 0 0		
Capt. G. A. Jacob, ..	0 1 0		
Ramjeebun Mookerjee, ..	15 0 0		
Venkata Krishna Modelier, ..	0 11 0		
Franjee Cowasjee Institute Native General Library, Bombay, ..			
	6 2 0		
Pandit Chandra Kant Tarkalankar, ..	1 2 0		
Babu Kuliprasad, ..	12 15 0		
		219 8 6	293

Carried over, Rs. 16,165 13 11

No. 2.

Oriental Publication Fund, 1876.

DISBURSEMENTS.				1876.	1875.
ORIENTAL PUBLICATIONS.					
Paid Packing charges,	..	..	11 12 0		
Ditto Postage Stamps,	..	..	137 8 0		
Ditto Freight,	..	..	85 6 0		
Ditto Advertising charges,	..	..	202 1 0		
Ditto Commission on Sale of Books, &c.,	..	..	33 12 0		
Ditto Coolies for removing Books and Shelves, &c.,	..	..	47 5 0		
Ditto Ticea Duffery for arranging Bibliotheca Indica,	..	..	9 4 0		
Ditto Carpenters' workmanship and supplying Rafter for Racks,	..	..	36 2 0		
Purchase of three Teakwood Racks,	..	..	183 0 0		
Ditto Petty charges,	..	..	7 11 9		
				753 13 9	774 1 0
CUSTODY OF ORIENTAL WORKS.					
Paid Salary of the Librarian,	..	..	600 0 0		
Ditto Establishment,	..	..	724 0 0		
Ditto Fee for Stamping Cheques,	..	..	3 2 0		
Ditto Banghy Expenses,	..	..	0 10 0		
Ditto Book Binding,	..	..	1 0 0		
Ditto Packing charges,	..	..	3 0 0		
Ditto Petty charges,	..	..	1 0 0		
				1,332 12 0	1,291 2 0
LIBRARY.					
Paid Purchase of MSS.,	..	..	70 0 0		
				70 0 0	6 6 6
CATALOGUE OF SANSKRIT MSS.					
Paid Salary for Cataloguing Sanskrit MSS.,	..	..	420 0 0		
				420 0 0	360 0 0
COPYING MANUSCRIPTS.					
Paid Copying MSS.,	..	..	16 6 6		
				14 6 6	157 0 3
ĀṢṢ-I-AKĀRĀ.					
Paid Editing and Printing charges,	..	..	445 0 0		
				445 0 0	96 0 0
GOBHILĀYA GRĀHYA SUTRA.					
Paid Printing charges,	..	..	224 0 0		
Ditto Postage,	..	..	0 13 0		
				224 13 0	140 5 0
SĀHITYA DARPAṆA.					
Paid Printing charges,	..	..	418 0 0		
				418 0 0	0 6 0
AKHARNĀMAH.					
Paid Editing charges,	..	..	192 0 0		
				192 0 0	688 0 0
SĀMA VEDA.					
Paid Editing and Printing charges,	2,100 8 9		
				2,100 8 9	1,220 10 0
Carried over, Rs.				5,971 6 0	

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RECEIPTS.	1876.	1875.
Brought over, Rs.	16,165 13 11	

Rs. 16,165 13 11

Examined and found correct.

DAVID WALDIE,
H. H. GODWIN-AUSTEN, *Major*.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st, 1876.

DISBURSEMENTS.

1876.

1875.

Brought over, Rs. 5,971 6 0

BIOGRAPHICAL DICTIONARY OF PERSONS WHO KNEW MUHAMMAD.			
Paid Editing and Printing charges,	..	710 8 0	
Ditto Copying charges, ..	..	127 8 0	
		<hr/>	838 0 0 25 0 0
ATTAREYA ARANYAKA.			
Paid Editing and Printing charges,	.	1,536 11 9	
		<hr/>	1,536 11 9 353 0 0
CHATURVARGA CHINTÁMANI.			
Paid Editing and Printing charges,	.	1,220 0 0	
		<hr/>	1,220 0 0 610 0 0
TABAQAT-I-NAQIRI.			
Paid Printing charges,	.	1,079 10 6	
Ditto Freight,	.	5 0 0	
Ditto Postage and Cooley,	.	0 11 0	
		<hr/>	1,085 5 6 2 12 0
BHÁMATÍ.			
Paid Printing charges,	.	498 0 0	
Ditto Freight,	.	16 6 0	
Ditto Postage and Cooley,	.	1 3 3	
		<hr/>	515 9 3
TAITTIHÍYA SÁNHITÁ.			
Paid Editing and Printing charges,	.	334 10 0	
		<hr/>	334 10 0
KÁMANDAKÍ NÍTISÁRA.			
Paid Editing and Printing charges,		320 0 0	
		<hr/>	320 0 0
Asiatic Society of Bengal, ..	..	1,086 5 9	
Babu Braj Bhushan Das, ..	..	52 13 6	
Basel Mission Book and Tract Depository, ..	..	5 1 0	
Babu Bhaiya Lala, ..	..	5 3 0	
Adhur Sing Gour, ..	..	0 5 0	
Ramjeebun Mookerjee, ..	..	30 0 0	
Venkata Krishna Modeliar, ..	..	0 11 0	
Framjee Cowasjee Institute Native General			
Library, Bombay, ..	..	6 3 0	
Rutton Lala, ..	..	1 6 0	
Gopal Rao Hurry, ..	..	3 0 0	
		<hr/>	1,191 0 3 615 4 6
BALANCE.			
In the Bank of Bengal, viz.			
Dr. J. Muir, ..	..	898 10 0	
O. P. Fund, ..	..	2,140 12 10	
		<hr/>	3,039 6 10
Cash in hand, ..	..	113 12 4	
		<hr/>	3,153 3 2

Rs. 16,165 13 11

Examined and found correct.

DAVID WALDIE,

H. H. GODWIN-AUSTEN, Major.

STATEMENT,
Conservation of Sanskrit MSS., in Account

Cr.	1876.
Balance of 1875,	Rs. 4,370 0 11
Received from the Government of Bengal, the amount sanctioned towards the Conservation of Sanskrit MSS., being	
2nd Half of 1875-76,	1,600 0 0
Ditto ditto 1st Half of 1876-77,	1,600 0 0
Sale proceeds of 47 copies Notices of Sanskrit MSS.,	47 0 0
Refund of the amount from Dr. Rajendralála Mitra, paid on the 14th September, 1875 for purchase of Sanskrit MSS.	1,200 0 0
Ditto Dr. from ditto ditto paid on the 8th September, 1876 for purchase of Sanskrit MSS.,	1,000 0 0
Ditto of Postage Stamps,	0 11 0
Received from Bábu Nil Komul Banerjia in Deposit,	0 4 0
	5,447 15 0

Rs. 9,817 15 11

Examined and found correct.

DAVID WALDIE,
H. H. GODWIN-AUSTEN, *Major.*

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st, 1876.

NO. 3.

Current with the Asiatic Society of Bengal.

Dr.			
			1876.
Paid Salary for preparing Catalogue of Sanskrit MSS.,	360	0	0
Ditto ditto for Translating the Sanskrit Catalogue,	240	0	0
Ditto ditto for Travelling Pandit,	550	0	0
Ditto Banghy expenses,	2	4	0
Ditto Printing charges of Notices of Sanskrit MSS. Vol. III. Part III. and Vol. III. Part IV.,	687	8	0
Ditto Contingent charges for Travelling Pandit,	5	10	6
Ditto Travelling Allowance for ditto ditto,	169	14	0
Ditto Purchase of Sanskrit MSS.,	800	10	0
Ditto Copying charges of Sanskrit MSS.,	91	4	0
Ditto yellow paper for copying ditto,	7	8	0
Ditto Fee to the Bank of Bengal for Stamping Cheques,	1	9	0
Ditto Purchase of Stationery,	9	10	0
Ditto Packing charges,	3	6	0
Ditto Freight for sending Notices of Sanskrit MSS. to Messrs. Trübner and Co.,	42	10	0
Ditto Postage Stamps,	21	11	6
Ditto Messrs. T. Black and Co. for preparing 13 plates and Lithographing and Coloring 510 copies of each of the above plates for Notices of Sanskrit MSS.,	367	3	0
Ditto Dr. Rajendralála Mitrá, as an advance on account of Travelling expenses for a Tour in search of Sanskrit MSS.,	1,000	0	0
Ditto Librarian, his Salary from May 1875 to April 1876,	160	0	0
Ditto Dr. Rajendralála Mitrá, for Travelling expenses to Patna, Benares, &c. including Railway fare, Carriage hire, &c.,	346	10	0
Ditto Present by way of Commission to Pandits and others,	36	0	0
Ditto Packing Cases, Charges of Packing, Cooley, Boat-hire, and Railway fare for MSS.,	13	3	6
Ditto for Copying and Purchase of 138 Copies of MSS.,	1,669	4	0
Ditto Loan, to the Asiatic Society of Bengal,	1,000	0	0
Ditto Petty Charges,	7	9	6
Ditto Salary for Bearer,	84	0	0
			7,667 7 0
BALANCE OF 1876.			
In the Bank of Bengal,	2,146	10	5
Cash in hand,	3	14	6
			2,150 8 11
			Rs. 9,817 15 11

Examined and found correct.

DAVID WALDIE,
H. H. GODWIN-AUSTEN, Major.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st, 1876.

STATEMENT NO. 4.

Shewing the Assets and Liabilities of the Asiatic Society of Bengal on the 1st January, 1877.

ASSETS.		1876.	1875.	LIABILITIES.		1876.	1875.
In Bank of Bengal,...	Rs. 3,749 10 9		3,858 2 3	Salary and Establishment for December, 1875,		332 2 8	348 10 8
Cash in hand,	218 6 3		160 9 4	Dr. Stoliczka Memorial Fund,		334 10 ⁵ 5	812 5 2
Government Securities,	3,968 1 0			Dr. Oldham Memorial Fund,		130 8 0	0 0 0
Ditto ditto on account of Piddington Pension Fund,	1,53,000 0 0		0 13,200 0 0	Piddington Pension Fund,		70 11 2	0 0 0
	500 0 0			Baptist Mission Press, Printing charges, Journal, Part II, No. III, of 1876,	420 9 0		
	1,57,468 1 0	17,218 11 7		Royal printing paper, ...	9 9 9	430 2 9	1,244 12 0
OUTSTANDING.							
Admission fees,	160 0 0	32 0 0		Oriental Gas Company Limited, Supplied Gas,		28 0 0	0 0 0
Subscriptions,	6,270 0 0	6,561 0 0		Messrs. Llewelyn and Co., for furnishing Marble Tablet for bust,		20 0 0	0 0 0
Sale of Journal,	278 1 9	358 7 9		Statesman Press for advertising Monthly General Meeting,		10 8 0	0 0 0
Subscription ditto,	567 13 9	607 9 9		O. P. Fund on Loan,		1,000 0 0	0 0 0
Sale of Library,	162 9 0	152 9 0		Conservation of Sanskrit MSS. on Loan, to Asiatic Society,		1,000 0 0	0 0 0
Due by the Bank of Bengal Fund Account,	7,438 8 6	7,711 10 6					
	364 13 7	275 5 1					
	Rs. 7,803 6 1	7,986 15 7					

We have examined this account and see no reason to doubt its correctness.

ASIATIC SOCIETY'S ROOMS,

Calcutta, Jan. 1st, 1876.

DAVID WALDIE,

H. H. GODWIN-AUSTEN, Major.

*Shewing the Assets and Liabilities of the Asiatic Society of Bengal, O. P. Fund,
on the 1st January, 1877.*

We have examined this account and see no reason to doubt its correctness.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st, 1876.

DAVID WALDIE,
H. H. GODWIN-AUSTEN, Major.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of February 1877.*

Latitude $22^{\circ} 33' 1''$ North. Longitude $88^{\circ} 20' 34''$ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	29.939	30.001	29.888	0.113	72.7	78.0	69.0	9.0
2	.961	.023	.920	.103	62.2	68.5	58.6	9.9
3	.949	.015	.902	.113	64.5	71.3	57.8	13.5
4	.874	.078	.813	.265	61.3	65.0	56.0	9.0
5	.883	29.950	.828	.122	61.2	73.3	57.8	15.5
6	.928	.992	.870	.122	66.4	73.0	61.5	11.5
7	.926	.986	.815	.141	65.4	75.2	61.5	13.7
8	.947	30.000	.889	.111	63.9	68.5	60.5	8.0
9	.993	.050	.933	.117	66.3	72.2	61.5	10.7
10	30.059	.141	30.005	.136	63.5	71.0	56.5	14.5
11	.089	.127	.009	.118	64.1	71.0	56.0	15.0
12	.033	.107	29.981	.126	66.1	73.2	59.5	13.7
13	.054	.120	30.008	.112	66.7	74.4	59.0	15.4
14	.129	.192	.062	.130	67.4	74.5	59.8	14.7
15	.140	.223	.084	.139	66.8	75.0	59.6	15.4
16	.103	.176	.052	.124	66.5	75.2	58.0	17.2
17	.111	.187	.054	.133	66.5	76.2	58.5	17.7
18	.117	.196	.071	.125	67.1	76.4	57.8	18.6
19	.127	.192	.080	.112	67.4	76.2	60.0	16.2
20	.131	.206	.068	.138	68.6	78.6	59.0	19.6
21	.096	.163	.028	.135	69.9	80.9	60.2	19.8
22	.060	.135	.015	.120	72.2	81.4	63.0	18.4
23	.028	.110	29.972	.138	74.0	84.8	65.7	19.1
24	.060	.136	30.011	.125	75.9	84.5	69.0	15.5
25	.080	.173	.004	.169	74.6	84.2	66.5	17.7
26	.054	.125	.004	.121	73.1	83.2	63.6	19.6
27	.035	.119	29.991	.128	73.3	84.7	62.5	22.2
28	.011	.092	.961	.131	75.1	86.0	66.9	20.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means, are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of February 1877.*

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon — (Continued.)

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Wet Bulb above Dew - point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humi- dity, complete satu- ration being unity.
	°	°	°	°	Inches.	Gr.	Gr.	
1	67.9	4.8	64.1	8.6	0.599	6.55	2.13	0.76
2	59.2	3.0	56.5	5.7	.465	5.20	1.09	.83
3	60.0	4.5	56.4	8.1	.464	.16	.60	.76
4	59.3	2.0	57.5	3.8	.481	.39	0.73	.88
5	60.6	3.6	57.4	6.8	.480	.33	1.36	.80
6	63.6	2.8	61.4	5.0	.519	6.08	.09	.85
7	62.5	2.9	60.2	5.2	.527	5.85	.10	.84
8	62.4	1.5	61.0	2.9	.541	6.02	0.61	.91
9	62.8	3.5	60.0	6.3	.523	5.80	1.35	.81
10	57.6	5.9	52.3	11.2	.404	4.51	2.04	.69
11	58.2	5.9	52.9	11.2	.412	.60	.07	.69
12	60.7	5.4	56.4	9.7	.464	5.11	1.96	.72
13	60.6	6.1	55.7	11.0	.453	.02	2.21	.69
14	60.5	6.9	55.0	12.4	.442	4.90	.49	.66
15	59.5	7.3	53.7	13.1	.423	.69	.57	.65
16	58.4	8.1	51.9	14.6	.398	.41	.78	.61
17	58.0	8.5	51.2	15.3	.589	.32	.87	.60
18	59.3	7.8	53.1	14.0	.415	.60	.72	.63
19	59.2	8.2	52.6	14.8	.408	.51	.88	.61
20	60.6	8.0	51.2	14.4	.431	.75	.92	.62
21	62.9	7.0	57.3	12.6	.478	5.25	.73	.66
22	65.6	6.6	60.3	11.9	.528	.79	.76	.68
23	67.9	6.1	63.6	10.4	.590	6.44	.60	.71
24	69.7	6.2	65.4	10.5	.626	.80	.77	.71
25	65.1	9.5	58.4	16.2	.496	5.40	3.80	.59
26	63.2	9.9	55.3	17.8	.447	4.89	.80	.56
27	63.9	9.4	56.4	16.9	.464	5.06	.78	.57
28	65.6	9.5	58.9	16.2	.504	.49	.85	.59

All the Hygrometrical elements are computed by the Greenough's hygrometer.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of February, 1877.*

**Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.**

Hour	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry B Thermomet	Range of the Tempera- ture for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid- night	30.034	30.152	29.898	0.254	65.0	72.0	59.3	12.7
1	.023	.16	.881	.262	61.4	71.3	58.9	12.4
2	.012	.36	.873	.263	63.8	70.5	58.4	12.1
3	.001	.32	.851	.298	63.3	70.2	58.0	12.2
4	29.997	.27	.815	.312	62.7	70.0	57.5	12.5
5	30.012	.12	.826	.316	62.1	69.6	59.6	12.7
6	.028	.55	.831	.321	61.5	69.3	56.0	13.3
7	.049	.169	.839	.330	61.4	69.7	56.5	13.2
8	.068	.188	.856	.332	63.2	71.5	58.0	13.5
9	.089	.206	.860	.316	66.9	73.8	59.5	14.3
10	.101	.223	.911	.309	69.8	76.4	60.5	17.9
11	.098	.212	.933	.279	71.7	80.8	56.0	24.8
Noon	.068	.188	.900	.288	73.1	82.5	56.6	25.9
1	.040	.166	.861	.302	71.1	83.0	57.8	25.2
2	.014	.126	.839	.287	75.	81.8	59.0	25.8
3	29.993	.108	.813	.295	75.	85.5	58.8	26.7
4	.985	.106	.811	.292	71.	86.0	58.6	27.4
5	.986	.115	.828	.287	71.	81.7	59.0	25.7
6	.995	.125	.818	.277	72	82.0	59.5	22.5
7	30.008	.137	.871	.266	70.	78.5	60.0	18.5
8	.027	.151	.886	.265	68.	77.0	60.4	16.6
9	.039	.145	.896	.269	67.	75.4	60.0	15.4
10	.045	.162	.991	.261	66	74.2	59.5	14.7
11	.043	.162	.899	.263	65.6	73.0	59.5	13.5

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means, are derived from the observations made at the several hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Cateyitta,
in the month of February 1877.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
-dependent thereon.—(Continued).

Hour.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Po	Dry Bulb above Dew Point	Mean Elk Vapour	Mean Weight of Vapour in a Cubic foot of air.	Add onal Weight o Vapour required for complete saturati	W duty, complete satura tion being unity.
	o				Inches.	Gr.	Gr.	
Mid- night	61.9	3.1	59.4	5.6	.0513	5.69	1.18	0.83
1	61.5	2.9	58.9	5.5	.503	.60	.14	.83
2	61.0	2.8	58.5	5.3	.498	.54	.07	.84
3	60.5	2.8	58.0	5.3	.489	.45	.06	.84
4	60.0	2.7	57.6	5.1	.483	.39	.00	.84
5	59.5	2.6	57.2	4.9	.476	.32	0.95	.85
6	59.1	2.4	56.9	4.6	.472	.27	.89	.86
7	58.9	2.5	56.6	4.8	.467	.23	.91	.85
8	59.7	3.5	56.5	6.7	.465	.19	1.30	.80
9	61.2	5.7	56.6	10.3	.467	.17	2.11	.71
10	61.9	7.9	55.6	14.2	.452	4.98	.97	.63
11	62.5	9.2	55.1	16.6	.444	.87	3.56	.58
Noon	62.9	10.6	55.5	18.0	.450	.92	.98	.55
1	63.3	11.0	55.6	18.7	.452	.93	4.59	.54
2	63.5	11.6	55.4	19.7	.449	.88	.46	.52
3	63.7	11.6	55.6	19.7	.452	.92	.48	.52
4	63.3	11.6	55.2	19.7	.445	.85	.43	.52
5	63.4	10.8	55.8	18.4	.455	.96	.13	.55
6	63.8	8.4	57.1	15.1	.475	5.20	3.35	.61
7	63.9	6.1	59.0	11.0	.506	.56	2.44	.70
8	63.6	5.0	59.6	9.0	.516	.70	1.97	.74
9	63.0	4.4	59.5	7.9	.515	.69	.70	.77
10	62.5	3.9	59.4	7.0	.513	.68	.49	.79
11	62.1	3.5	59.3	6.3	.511	.67	.33	.81

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of February 1877.*

Solar Radiation, Weather, &c.

	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	WIND			General aspect of the Sky.
			Prevailing direction.	Ma Pres lb	Da Veloc Miles	
1	134.0	...	S S W & N W	...	114.0	~i & ~i to 8, ~i to 10 A. M., ~i to 5, B to 8, ~i to 11 P. M.
2	...	0.29	N N E & S	...	113.6	~i to 3 A. M., O to 7, B to 11 P. M. Slight R after intervals from 5 A. M. to 3 P. M.
3	135.0	...	S S W & E	...	41.9	~i to 7 A. M., ~i to 1, ~i to 6, S to 11 P. M. D at 11½ P. M.
4	...	0.62	E by N & E S E	7.9	161.0	S to 2 A. M., O to 8, S to 11 P. M. T at 11 A. M. L at 11 A. M. & 11 P. M. R after intervals.
5	125.0	...	N N W & N	...	105.6	O to 9 A. M., ~i to 12, B to 11 P. M. Slightly foggy from 9 to 11 P. M.
6	134.0	0.05	N by W & E	...	76.1	B to 3, ~i to 6, O to 11 A. M., ~i to 3, B to 11 P. M. Light R at 6½, 7½ & 8 A. M.
7	129.0	1.00	E S E & E N E	8.0	124.6	B to 3 A. M., ~i to 12, O to 4, ~i to 6, B to 8. O to 11 P. M. R at 7½ A. M. & from 12½ to 4½ & at 11 P. M.
8	86.0	0.30	E by N & N W	...	199.8	O to 8 A. M., ~i to 12, O to 4, ~i to 6, ~i to 11 P. M. Slight R at 4½ from 6½ to 8, at 11 A. M. & 2½ P. M.
9	132.8	...	N W & N	...	87.8	~i to 1, B to 9 A. M., ~i to 5, B to 11 P. M. Slightly foggy at 9 & 10 P. M.
10	126.5	...	N & N by E	...	143.4	B. Slightly foggy from 8 to 11 P. M.
11	129.0	...	E, N E & W by N	...	105.0	B to 11 A. M., ~i to 1, ~i to 3, ~i to 6, O to 9, S to 11 P. M. Slightly foggy at Midnight.
12	127.1	...	W by N & E N E	...	40.0	Chiefly B. Foggy from 9 to 1 P. M.
13	127.8	...	ENE, NE & NNE	...	83.4	B to 1, ~i to 8, B to 11 P. M. Slightly foggy at Midnight.

~i Cirri, —i Strati, ~i Cumuli, ~i Cirro-strati, ~i Cumulo-strati, ~i Nimbi,
~i Cirro-cumuli, B clear, S stratonii, O overcast, T thunder, L lightning,
R. rain, D. drizzle.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of February 1877.*

Solar Radiation, Weather, &c:

No.	Inches.	Surface Temperature.	WIND. Prevailing direction.	Max. Temp.	Daily Velocity.	General aspect of the Sky.
14	133.5		N N E & N N W	111.8		B to 3, \i to 7 A. M., B to 1, \i to 5, \i to 8, B to 11 P. M.
15	130.0		NNW, NE & NW	99.4		B. Slightly foggy from 8 to 11 P. M.
16	131.0		N W & W by N	52.8		B.
17	131.0		S W & W N W	76.9		B. Foggy from 9 to 11 P. M.
18	130.4		W N W & S W	72.3		B. Slightly foggy at Mid- night, 1 A. M. 8 & 9 P. M.
19	132.0		S W & W N W	92.3		B.
20	133.0		W N W & W by N	66.1		B. Slightly foggy from 8 to 11 P. M.
21	133.0		W by N & S S W	33.3		Chiefly B. Slightly foggy from 7 to 10 P. M.
22	134.4		S by E & S by W	71.9		B to 11 A. M., \i to 1, \i to 6, \i to 9, B to 11 P. M.
23	140.5		S by W & S S W [W by N	92.3		B to 8, \i to 11 A. M., \i to 2, \i to 5, \i to 11 P. M.
24	136.0		S by W, S S W &	98.5		\i to 3, \i to 6, \i to 10 A. M., B to 2, \i to 4, B to 11 P. M.
25	136.1	...	N N E & W N W	91.2		B. Slightly foggy at Mid- night, 1 A. M. & from 8 to 11 P. M.
26	137.0	...	W N W & N W	138.3		B. Slightly foggy from 8 to 10 P. M.
27	137.3	...	N W & W by N	108.6		B.
28	137.4	...	W by N & W S W	100.8		B.

\i Cirri, —i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi,
\i Cirro-cumuli, B clear, S straton, O overcast, T thunder, L lightning,
R. rain, D. drizzle.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of February 1877.*

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	30.032
Max. height of the Barometer occurred at 10 A. M. on the 15th	30.223
Min. height of the Barometer occurred at 3 P. M. on the 4th	29.813
<i>Extreme range</i> of the Barometer during the month ...	0.410
Mean of the daily Max. Pressures	30.108
Ditto ditto Min. ditto	29.977
<i>Mean daily range</i> of the Barometer during the month ...	0.131

	°
Mean Dry Bulb Thermometer for the month	68.0
Max. Temperature occurred at 4 P. M. on the 28th	86.0
Min. Temperature occurred at 6 A. M. on the 4th & 11th	56.0
<i>Extreme range</i> of the Temperature during the month ...	30.0
Mean of the daily Max. Temperature	76.3
Ditto ditto Min. ditto,	60.9
<i>Mean daily range</i> of the Temperature during the month	15.4

Mean Wet Bulb Thermometer for the month	62.0
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	6.0
Computed Mean Dew-point for the month	57.2
Mean Dry Bulb Thermometer above computed mean Dew-point	10.8

	Inches.
Mean Elastic force of Vapour for the month	0.476

	Grain.
Mean Weight of Vapour for the month	5.25
Additional Weight of Vapour required for complete saturation ...	2.28
Mean degree of humidity for the month, complete saturation being unity	0.70

	°
Mean Max. Solar radiation Thermometer for the month	130.7

	Inches.
Rained 7 days.—Max. fall of rain during 24 hours	1.00
Total amount of rain during the month	2.26
Total amount of rain indicated by the Gauge* attached to the anemo- meter during the month	1.61
Prevailing direction of the Wind	W N W & N W

* Height 70 feet 10 inches above ground.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR MARCH, 1877.

The Monthly General Meeting of the Asiatic Society was held on Wednesday, the 7th inst., at 9 o'clock p. m.

The Hon. Sir E. C. Bayley, K. C. S. I., President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Government of Bombay—

The Book of Arda Viraf. By Dr. M. Haug and Dr. E. West, with a Glossary and Index.

Vendidad, translated into Guzerati, by Kavasji Edabji Kanga.

2. From Commander A. Dundas Taylor, Superintendent Marine Survey Dept.—

A list of Light Houses and Light Vessels in British India, including the Red Sea and Coast of Arabia, corrected up to January 1877, by R. C. Carrington.

A Chart of the Madras Roadstead Survey, by Lieut. F. W. Jarrad, R. N. and Mr. P. J. Falle. October 1876.

3. From the authors, copies of the following—

“The Oriental Sore as observed in India;” and “Leprosy in India.” By T. R. Lewis, M. B. and D. D. Cunningham, M. B.

4. From the Author, a copy of “The Rámáyana of Tulsi Das, Book 1, by F. S. Growse.

5. From the Rev. F. Foulkes, a copy of “Introduction to the Nannul; The Tathil text and the English Translation.” By Rev. H. Bower.

6. From Mrs. Woodrow, copies of back numbers of the Journals of the Society from 1851 to 1873 and of the Proceedings from 1865 to 1875, belonging to her late husband.

The following gentlemen, duly proposed and seconded at the last Meeting, were elected Ordinary Members—

The Hon. Bazett Wetenhall Colvin, C. S.

The Rev. A. E. Medlicott.

The following are candidates for ballot at the next Meeting—

(1.) Rev. A. N. W. Spens, Chaplain, Bengal Establishment, proposed by Colonel A. D. Vanrenen, seconded by Major H. H. Godwin-Austen.

(2.) Irwine John Whitty, Esq., Supdt. of the Khurhurbari Collieries, Giridhi, E. I. R., proposed by Mr. H. B. Medlicott, seconded by Dr. O. Feistmantel.

The following gentlemen have intimated their desire to withdraw from the Society—

Messrs. A. J. Hughes, C. E. and F. C. Daukes, C. S.

The PRESIDENT reported that the Council had approved of the following modification of the proposed rule suggested by Mr. H. F. Blanford at the December meeting, and would recommend it in the usual way to the whole body of Members for adoption.

"Before circulating any question coming under clause (c) of rule 64 for the votes of the general body of Members of the Society, the Council shall cause to be sent to every resident Member, at least 48 hours before the general meeting at which such question is to be proposed, a printed circular in which shall be set forth the nature of the proposal, and the reasons for it, in order that it may be duly discussed at such general meeting. A statement of any objections that may be raised at the meeting against the proposal, shall also be circulated with the voting papers."

The COUNCIL announced that they had appointed Mr. T. S. Isaac a Trustee of the Indian Museum on behalf of the Society, in accordance with the provisions of the new Museum Act which gives an additional Trustee on the part of the Society.

Also that the following gentlemen had been appointed to serve on the several Committees during the ensuing year.

Sub-Committee of Finance.

Dr. T. R. Lewis.

Dr. Rájendralála Mitra.

H. B. Medlicott, Esq.

Colonel J. F. Tennant, R. E.

Library.

Dr. Rájendralála Mitra.

A. Pedler, Esq.

Colonel J. F. Tennant, R. E.

Dr. Mohendralal Sircar.

G. Nevill, Esq.

C. J. Lyall, Esq.

Dr. D. D. Cunningham.

Dr. W. K. Waller.

Bábu Prannath Pundit, M. A.

C. H. Tawney, Esq., M. A.

W. S. Brough, Esq.

Whitley Stokes, Esq., C. S. I.

W. T. Blanford, Esq.
 H. F. Blanford, Esq.
 C. H. Wood, Esq.
 Dr. O. Feistmantel.
 John Elliott, Esq. M. A.
 A. M. Nash, Esq.,
 Dr. J. Anderson.

Lieut. F. W. Jarrad, R. N.
 H. H. Locke, Esq.
 R. Parry, Esq.
 Dr. T. R. Lewis.
 H. Beverley, Esq., C. S.
 J. Crawford, Esq., C. S.

Philology.

Dr. Rájendralála Mitra.
 C. H. Tawney, Esq., M. A.
 Major-General A. Cunningham,
 C. S. I.
 J. Beames, Esq.
 F. S. Growse, Esq.
 Rev. K. M. Banerjea, LL. D. .
 Bábu Gour Das Bysack.
 Dr. Mohendralal Sircar.

Moulvie Abdul Latif Khán Bahá-
 dur.
 Moulvie Kabiruddin Ahmad Sahib.
 Bábu Dvijendranath Thakúr.
 Whitley Stokes, Esq., C. S. I.
 Bábu Prannáth Pándit.
 Dr. G. Thibaut.
 C. J. Lyall, Esq.
 Bábu Pratápa Chandra Ghosha.

Natural History.

G. Nevill, Esq.
 H. F. Blanford.
 V. Ball, Esq.
 H. B. Medlicott, Esq.
 Dr. O. Feistmantel.
 D. Waldie, Esq.
 A. O. Hume, Esq., C. B.
 Dr. D. D. Cunningham.
 Dr. J. Armstrong.
 S. Kurz, Esq.
 Dr. G. King.

S. E. Peal, Esq.
 W. E. Brooks, Esq., C. E.
 Dr. J. Scully.
 Dr. W. Schlich.
 Dr. T. R. Lewis.
 R. Lydekker, Esq.
 W. T. Blanford, Esq.
 Major H. H. Godwin-Austen.
 Capt. G. F. L. Marshall, R. E.
 Dr. J. Anderson.
 Lieut. F. W. Jarrad.

Physical Science.

Col. H. L. Thuillier, C. S. I.
 H. B. Medlicott, Esq.
 H. F. Blanford, Esq.
 D. Waldie, Esq.
 A. Pedler, Esq.
 R. S. Brough, Esq.
 Dr. D. D. Cunningham.
 Dr. T. R. Lewis.
 Major H. H. Godwin-Austen.
 A. Cappel, Esq.

T. S. Isaac, Esq., C. E.
 Col. J. F. Tennant, R. E.
 Commander A. D. Taylor.
 Dr. O. Feistmantel.
 R. Lydekker, Esq.
 V. Ball, Esq.
 Col. D. G. Robinson, R. E.
 Rev. F. Lafont.
 J. O'Kinealy, Esq.
 W. T. Blanford, Esq.

C. H. Wood, Esq.

A. M. Nash, Esq., M. A.

Dr. J. Scully.

W. D. Bruce, Esq., C. E.

J. Elliott, Esq., M. A.

Coins.

The Hon. Sir E. C. Bayley,
K. C. S. I.Major-General A. Cunningham,
C. S. I. .

Col. J. F. Tennant, R. E.

Col. F. W. Stubbs, R. A. .

Dr. Rájendralála Mitra.

Rev. M. A. Sherring.

The PRESIDENT exhibited to the meeting the portrait of the late Dr. Stoliczka, which had just arrived from England, together with a copy of a photograph of it by the Woodbury process, of which a copy would be presented to every subscriber to the Fund, and read the following extract from a letter of Mr. A. Grote on the subject :

"I enclose you a photo. of Dickinson's portrait of Stoliczka, which is now in King & Co.'s hand for shipment to Calcutta. The print is I think fairly satisfactory, it is from a second negative taken from an unsuccessful print which I had touched up by an artist under Dickinson's supervision. The cost of the work therefore will be some £4 over the original estimate. Geflowski's second model for the bust seems to have been approved by Oldham, Hyde and Medlicott, and he is now proceeding with the work in marble."

The SECRETARY read an extract of a letter from Mr. W. H. Dall, of the United States Coast Survey, to his father, the Rev. C. H. Dall, M. A., announcing the death of Mr. F. B. Meek, the celebrated American Palæontologist.

Dr. FEISTMANTEL said—On the 21st December, 1876, died at Washington, Mr. F. B. Meek, the excellent Palæontologist of the United States Geological and Geographical Survey under the direction of Prof. Hayden. He published a great many important papers treating on the most various subjects of zoological palæontology, from almost all formations in different countries. These papers were published by him partly alone, partly in company with Mr. T. Hall, Mr. T. V. Hayden and lately with Mr. A. H. Worthen.

His palæontological papers are contained in different American Journals and Proceedings of Societies, but the most important are in the Survey papers, *viz.*, in the publication on the Geological Survey of California, Vol. I. 1867, on Carboniferous and Jurassic Fossils (with 8 Plates)*; in the papers on the Survey of Illinois, Vol. II, 1866, Description of Invertebrates from the Carboniferous System, by F. B. Meek and A. H. Worthen—(with many plates); Vol. III, 1868, Palæontology of Illinois, by Meek and Wor-

then. In the paper on the Geological Survey of Ohio, Vol. I, 1873, he described the Invertebrate Fossils of the Silurian and Devonian systems of Ohio, with 28 Plates, and, only a short time before his death, he completed his great work on Cretaceous and Tertiary Invertebrate Fossils of the Upper Missouri country in one large quarto volume. His death is certainly a great loss to American palæontology and to science altogether. These few notes would be sufficient to show his thorough knowledge of Zoological Palæontology in all its branches, but it was to be hoped that a more complete biography of Mr. Meek would be given hereafter.

The PRESIDENT announced that arrangements had been concluded for obtaining a memorial bust of Dr. Oldham by Mr. Geflowski.

The SECRETARY read an extract from a letter from the Vice-Presidents, Hofrath von Hauer, Director of the Imperial Geological Institute, and Hofrath Brunner von Wattenwyl, and Herr Döblhoff, Secretary, stating that they had established a Scientific Club at Vienna, (9, Eschenbach Gasse) and hoped that Members of the Asiatic Society would become guests or foreign members of the Club when they came to Vienna.

On the proposal of Mr. H. F. Blanford, seconded by Col. H. L. Thuillier, C. S. I., a vote of thanks to the Club for their kind and hospitable invitation was unanimously agreed to.

Dr. RÁJENDRATÁLA MITRA submitted to the inspection of the meeting a copper-plate grant sent to him for examination by Mr. E. T. Atkinson of Allahábád. It had been obtained from the Ráwal of Badrináth, resident at Pándukésvar through Sir Henry Ramsay. It measures 24 by 16 inches, and has a scalloped head on the left side, 5 inches high. In the middle of the head is let in a thick lead seal, 3 inches in diameter, about half an inch of its side standing above the surface of the plate, and projecting a quarter of an inch behind. The seal bears the figure of a bull couchant in bas-relief, and a legend in two lines of writing in relief. The inscription on the plate, extending to 29 lines, runs lengthwise from end to end, the last line being in several places detached, and the spaces filled up by ornamental scrolls, representing longitudinal halves of serrated leaves. The letters are of the Kuṭila type, and the language is Sanskrit. (Plate I.)

The subject of the record is the gift of two wards (*palli*), one named Khásiyaka in the sub-division or village of Saurunnosá, and the other named Guggula in the subdivision or village of Pánibhuti, both situated in the district (*viśaya*) of Kártikeyapura, to a Bráhmaṇ named Páráyapa Bhaṭṭáraka, for the worship of a goddess in the village of Saurunnosá. The grant was made on the day when the summer solstice began, on the 3rd

of the wane in the month of Māgha, Samvat 21st year of the king's reign. The record was composed by Ayata, the minister of war and peace, written out by the secretary or chief scribe Yijaka, and inscribed by one Gangabhadra. The donor was a king named Lalitasuradeva, son and successor of Ishtaganadeva, by Vegadevi, and grandson of Mimbara. The conveyancer is most lavish in his praise of the three kings, and has showered a large number of epithets in praise of them; but he affords no clue to the country over which the kings reigned. The date, though called Samvat, is obviously not intended for the era of Vikramāditya, as it is preceded by the epithet *pravardhamāna-vijya-rāja-samvatsara* which can only refer to the reigning sovereign. The character is unmistakably of the 10th century, and that is the date which can reasonably be assigned to the record. The legend on the seal repeats the geneology as given in the body of the record.

Transcript of an inscription from Pāṇḍukeśvar near Baidyanāth.

- (१) स्वस्ति श्रीमत्कार्तिकेयपुरातनकणामरदिततनुजमनुजविभुभक्ति-
भावभरभारानमितामितोत्तमाङ्गसङ्गिविकटमुकुटकिरीटविटङ्गको-
टिकोटिशेलोकता—
- (२) नाना(ताता)यकप्रदीपदीपदीधितिपानमदरक्तचरणकमलमणविपु-
लबज्जलकिरणकेशरासारसारिताशेषविशेषमेधिघनतमस्त्रेजसस्त्र-
धुनीधैतजटाजू—
- (३) तस्य भगवतो धूर्जटेः प्रसादान्निजभुजोपार्जितैर्जितनिर्जितरिपु-
तिमिरजब्धोदयप्रकाशदयादाक्षिण्यसत्त्वसत्त्वशीलशौचशौर्योदार्यगा-
भ्योर्यमर्यादार्यदृष्टास्वर्य—
- (४) कार्यवर्यादिगुणगणानङ्गतशरीरः महासुहृत्सन्तानबीजावतारः क-
तयुगागमभूपाणजितकीर्तिः नन्दाभगवतीचरणकमलकमलासनाय-
मूर्तिः श्रीमिम्बरक्तस्य त—
- (५) नयक्तत्पादानुध्यातो राज्ञी महादेवी श्रीनाम्नदेवी तस्यामुत्पन्नः परम-
माहेश्वरः परमब्रह्मण्यः श्रितहृष्यायधारोत्कृतमत्तेभकुम्भाकृष्टोत्कृष्ट-
मुक्तावणीयशःपताका—
- (६) पञ्चायचक्रिकापद्मसिततारागण्यः परमभट्टारकमहाराजाधिराजपर-
मेश्वरश्रीमद्विद्यगणदेवकस्य पुत्रकत्पादानुध्यातो राज्ञी महादेवी
श्रीवेगदेवी तस्यामुत्पन्नः परममा—

- (७) ऐश्वर्यः परमब्रह्मणः कश्चिन्नकपटपङ्कतमधरपङ्कजहारधारितधौरे-
यवरवराहचरितः सहजमतिविभवविभुविभूतिस्त्रिगतादातिचक्र-
प्रतापदहनः । अतिवैभवसंहारारम्भसं—
- (८) भूतभीमभुक्कुटिकुटिकेसरिसटाभीतभीतारातीभक्तभभरः अर-
न्ध्यादन्धकायवाङ्मयप्रायगन्धडाह्योत्कृष्टकीर्णयज्यक्षीप्रथमस-
माक्षिप्त्वावल्लो—
- (९) कनकवल्गुसखेदसुरसुन्दरीविधूतकरस्त्रजद्वयकुसुमप्रकरप्रकीर्णव-
तंससम्बद्धितकीर्तिबीजः पृथुरिव दीर्घस्यसाधितधनुर्म्मखजवावह-
म्भवश—
- (१०) वशीकृतगोपाकनानिश्चलीकृतधराधरेन्द्रः परमभट्टारकमहाराजा-
धिराजपरमेश्वरश्रीमल्लजितशूरदेवकुशली अस्मिन्नेव श्रीमत्कार्तिके-
यपरविषये समु—
- (११) पगताम् सर्वानवगियोगस्थान् राजराजतक्षराजपञ्चाङ्गदामात्मसाम-
न्तमंहासामन्तठक्कुरमहामनुष्यमहाकटं कृतिकमहाप्रतीहारमहाद-
खनायकमहाराजप्रमातारश—
- (१२) रभङ्गकुमारामात्रोपरिकदुस्साध्यासाधनिकदशापराधिकचौरोद्धर-
णिकशैल्लिकशैल्लिकतदायुक्तकविनियुक्तकपट्टाकापचारिकाशेषभ-
ङ्गाधिकृतहस्त्यश्वोद्ध—
- (१३) वल्ल्याष्टकभूतप्रेषणिकदखिकदखपाशिकगमागमिष्ठाङ्गिकाभिलर-
माखकराजस्थानीयविषयपतिभोगपतिनरपत्न्यपति + खरक्षप्रति-
शूरि—
- (१४) कस्थानाधिकृतवर्त्मपालकौट्टपालघट्टपालक्षेत्रपालप्रान्तपालकिशोर-
वरवृगोमहिष्यधिकृतभट्टमहत्तमाभोरवणिक्खेष्ठिपुरोगास्तकादश-
प्रक्ष—
- (१५) त्यधिल्लानीयान्खवकिरातत्रविहकलिकुशैरङ्गयोङ्गमेदान्भुवाङ्गल-
पर्यन्तान्सर्वसम्वासास्समस्तजनपदाग्भटापटसेवकादीनन्यांश्च कीर्त्ति-
तानकीर्त्तितान्स—
- (१६) त्यादपद्मोत्पञ्जीविनः प्रतिवासिनश्च त्राक्ष्योत्तरान् यथाहं मनयति
बोधयति समाद्यापयत्यकु तेस्माद्विदितमुपरिनिर्दिष्टविषये गोवत्त-
सायां प्रतिबद्धखवियाक—

- (१०) परिभुज्यमानपक्षिका तथा पक्षिभूतिकायां प्रतिबद्धगुण्यपरिभुज्य-
मानपक्षिकादयं एते मया मातापित्रोरात्मनश्च पुण्ययशोभिदृज्ये
पवनविघट्टिता—
- (१८) अथ्यपचवचनतरङ्गजीवलोकमवलोक्य जनबुद्धाकारमसारं वायुदं-
द्वा गजकनभक्त्यायचपकताश्चालक्ष्य त्वापरस्तोत्रनिःश्रेयसार्थसंसार-
ार्थोत्तरयार्थश्च
- (१९) पुण्येहनि उत्तरायणसङ्क्रान्तौ गन्धपुष्पधूपदीपोपजेपननैवेद्यवज्रिच-
न्द्यगेयवाद्यसत्त्वादिप्रवर्त्तनाय खल्वस्फुटितसंस्कारणाय अभिनवक-
र्मकरणा—
- (२०) य च भूतपदमूलभरण्याय च गोब्रह्मसायां महादेवीश्रीसामदेव्या
स्वयंकारायितभगवते श्रीनारायणभट्टारकाय शासनदानेन प्रति-
पादिताः प्रकृतिपरिहारयुक्ताः
- (२१) प्रघाटाभटाप्रवेशः अकिञ्चित्प्राच्याः अनाच्छेद्य आचन्द्रार्काक्षितिस्थि-
तिसमकालिकः विषयादुद्धृतपिण्डास्त्रसीमागोचरपर्यन्तस्य वृत्तारा-
मो ऋदप्रखवयोपे—
- (२२) तदेवब्राह्मणभुक्तभुज्यमानवर्जिताः यत्स्वसुखं पारंपर्येण परिभुञ्जत-
श्चास्योपरिनिर्दिष्टैरन्यतरैर्वा धरणविधारणपरिपन्थिजनानादिकोप-
द्रवो मनागपि न कर्त्त—
- (२३) यो नान्यथा - - महान्द्रोहः स्यादितिप्रवर्द्धमानविजयराज्यसम्बत्सर-
एकविंशतिमे सम्बत् २१ माघवदि ३ - - - महादानाक्षयपटकाधि-
कृतश्रीपीजकः । लि—
- (२४) खितमिदं महासन्निविराक्षपटकाधिकृतश्रीमदायटाववनाटङ्को-
त्कीर्णा श्रीगङ्गभद्रेण । बद्धभिर्बन्धुधा भुक्ता राजभिः सगरादिभिः ।
यस्य यस्य यदा भूमिस्त—
- (२५) स्य तस्य तदा कर्ण । सर्वानेतान् भाविनः पार्थिवेन्द्रान् भूयो भूयो
याचते रामभद्रः । सामान्योऽयं धर्मसेतुर्नृपाणां कलिकाज पात-
नीयो भवद्भिः । खदत्तां परदत्तां वा यो ह—
- (२६) रेत वसन्तरां । षष्टिर्बर्षसहस्राणि श्रविषा जायते क्षमिः । भूमे-
र्दाता याति कोके सुराणां हंसैर्मुक्तां वानमावह्य दिशं नौष्टे कुम्भे
तैलपूर्णे सुतते । भूमेर्ह—

(२०) सी पश्यते कालदूतैः । वष्टिवर्षसप्तश्रावि खर्गे तिष्ठति भूमिदः ।
 आच्छेत्ता चागमन्ता च तान्येव नरके वसेत् ॥ गामेकाश्च सुवर्णाश्च
 भूमेरप्येकमकुण्डं । हत्वा नरकमायाति यावदाहृतिसंभवं । वानोह
 दत्तानि पुरा नरेऽर्द्धैर्दानानि धर्म्मार्थयशस्कराणि । निर्माख्यवन्ति
 प्रतिमानि तानि को नाम साधुः पुनराददीत ।— — —

(२८) अममिदं समुदाहरद्विरन्यैश्च दानमिदमभ्यनुमोदनीयं कथाग्राह्य-
 त्सन्निवृद्धदक्षकायाः । दानं फलं परयशःपरिपाकनञ्च ॥ इति
 कमलदक्ष—

(२९) विन्दुकोणमिदमनुचिन्त्य मनुष्यजीवितञ्च । सकलमिदमुदाहृतञ्च
 बुद्ध्या न हि पश्यैः परकीर्तयौ विजोप्याः ॥

Legend on the Seal.

श्रीमिम्बरस्तत्पादानुध्यातः ।

श्रीमदिष्टगणदेवः तत्पादानुध्यातः ।

श्रीमक्षत्रितशूरदेवः क्षितीशः ।

The following papers were read :—

1. *Note on the Variation of the Barometric Tides in connection with diurnal Land and Sea Breezes.*—By HENRY F. BLANFORD.

(Abstract.)

Mr. H. F. Blanford said that one of the commonest and most familiar illustrations of convection currents, given in Manuals of Physics and Meteorology, is that of the diurnal land and sea breezes. During the morning hours the solar heat falling on the land, heats and expands the air resting on its surface to a much greater extent than that resting on the sea. Supposing then, that previously to this heating, the several strata were in equilibrium, the result must be, that the isobaric planes will be disturbed and made to incline towards the sea. At the ground surface this disturbance will be very small, but will increase with increased elevation. A further consequence will be that, above a certain level, a current of air will flow from over the land to the sea, raising the pressure over the latter, and, at the sea surface, raising it above the pressure on the land surface. A return current will be generated in the lower strata of the atmosphere, especially during the afternoon, and this constitutes the well known sea-breeze. At night, owing to the cooling and contraction of the air over the land, all these actions will be reversed. The isobaric planes will incline

towards the land, an upper current flow in the same direction and the pressure at the land surface being exalted by this access of air, over that at the sea-surface, a land wind will be produced blowing towards the sea. If then this theory be true we ought to find a greater pressure over the land in the early morning, over the sea in the afternoon. Hitherto, however, there had been no means of verifying this inference and so verifying the theory. This verification had lately been supplied by data furnished by the log books collected by the London Meteorological office, copies of which (relating to Indian Seas) had recently been made for the Indian Meteorological office, under the sanction of the Secretary of State, and with the permission of the Meteorological Committee of the Royal Society. The logs as yet received, related only to the month of January. On extracting from them the barometric observations made at intervals of 4 hours, between N. lat. 20° and the Sand Heads (lat. $21^{\circ} 3'$), and taking the means of all those made at corresponding hours, the result showed with considerable accuracy the daily oscillation of pressure at an average distance of 70 miles from the land, since the observations were sufficiently numerous to eliminate all temporary irregularities of importance. When the curve representing the diurnal oscillation was computed from these data by Bessel's interpolation formula, and compared with that of Calcutta for the same month, it was found that the mean pressure of the two places being assumed to be equal, the pressure at the land station was in excess from 1 A. M. to 1 P. M. and that given by the ship observations in excess from 1 P. M. to 1 A. M., thus offering a very satisfactory verification of the theory just sketched out.

2. *The Kaimúr Range.*—By CHANDRA SEKHARA BANARJI.

(Abstract.)

The author describes the principal geographical and geological features of the Kaimúr Mountains. The range is called by the natives and in the Púrānas 'Vindhya-mali' to which properly speaking it also belongs. Another name for it is *Kairo-mali*, 'the range of the Kaira-Des,' and it is probable that the word 'Kaimúr' is a corruption of 'Kairomali.'

The legend connected with the Karamnásá and Son rivers are given, and the paper concludes with a description of several shrines near Rohtás-garh. The author also gives two inscriptions, of Samvat 1173 and 1271.

The paper will be printed in No. 1, Pt. I, for 1877.

3. *Description of Ruticilla Shisticeps.*—By W. T. BLANFORD, Esq., F. R. S.

This paper will appear in the Journal, Part II, with a coloured Plate.

4. *On Giants'-Kettles (pot holes), caused by water action in streams in the Rajmahal Hills and Barakur district.—By DR. O. FEISTMANTEL.*

(Abstract.)

Giants'-Kettles, or 'pot holes' as they are described in Handbooks on Geology and Physical Geography, are more or less regular cavities of various sizes in diameter and depth, excavated in all sorts of rocks. They were first described from Sweden, in 1769, and later from other localities; and various mythic stories were brought into connection with them in former times.

But while in most cases the Giants'-Kettles were shown to have been produced by running water, by cataracts in streams, &c., and to be of recent age only, yet for some others another time and cause was assigned, and they were found to have their origin in that post-tertiary time, which is termed the glacial period—and from this point of view they are certainly of geological interest.

As the author had observed the same forms in two different localities in Bengal, and as there is, so far as he knew, only one case from India recorded, he thought himself justified in describing those cases he had himself observed. They are a contribution to those forms which are produced in present times, apparently by running water in streams, and will certainly not be without interest especially for geologists in Europe, where similar forms are better known and thought worthy of description.

Last year he observed Giants'-Kettles in the Rajmahal Hills, in the Bansloi Nuddee, E. S. E. from the village Amrapura. In the Rajmahal district this river runs in a bed of trap-rock, which is often very hard, and in this rock also the pot holes are excavated.

At the time when he visited this place, there were two complete pot-holes in the river bed, with circular apertures and pretty deep; one was larger than the other, the diameter of its aperture being 96 c. m., the depth 120 c. m.; the other one measured 98 c. m. in diameter and 66 c. m. in depth. Both were polished inside and shewed circular ridges, which might indicate certain periods of excavation. In one of them there was water at the bottom, in the other one a heap of sand.

Close to these were two others, through which at that time water was flowing, having a distinct "affluent" and "effluent" channel, and producing a regular whirlpool in the cavity, in which sand and small pebbles were rolling round; there was no waterfall, the water flowing quite horizontally. They shewed the same conditions as the other ones only that they were not yet so deep, but clearly indicated the way in which the others also were produced. During the rainy season when the river is high, the force of the running water is much more rapid and larger pebbles are

driven in and rolled round—and this especially causes the excavation of the holes. The rock all round was more or less polished, showing various holes unfinished or just begun. The river-bed was very regularly longitudinally furrowed and polished, in the same way as is generally ascribed to ice action, but in this case undoubtedly, only by the force of the *running* water, in which sand and stones are carried down.

This year he had observed similar forms in the Bārākur district, near Nirsha (6 miles west of Barākur), in the Kudi-Nuddi. Here the sandstone of the coalstrata crops up in many thick ridges and immense blocks lie about, which from their polished surfaces and polished edges show, that they must have been carried there by the stream. It was in three of these blocks that he observed the Kettles. They were all complete, the dimensions were the following :

1. Aperture of diameter 60 c. m., depth about the same. 2. Dimensions almost the same. 3. The longer diameter 76 c. m., the shorter one 70 c. m., and the depth 85 c. m. The other conditions were the same as in those in the Rajmahal Hills.

In this locality also there is no doubt that running water, and not a cataract, caused the pot holes, and that the excavation is still in progress, especially in the rainy season.

In one of these pot holes in the Kudi-Nuddi there was a heap of sand and round pebbles, in another some water on the bottom.

There is therefore not the least doubt but that these forms are caused by running and whirling water only, without the aid of cataracts; and some phenomena, especially the polished surface of the rocks and the longitudinal furrows in the river bed in the Rajmahal Hills are not at all unlike those which are described as produced by glaciers, although this cause cannot be thought of at all.

Of the reported cases from other countries the most important are enumerated in the paper and the different ways of explanation are given.

Among these are the cases reported by Mr. Jackson from New-Hampshire; (1844), by Mr. Martins from the Chamonix valley (1844); by M. Collegno from South France, in the Tarn River (1844); by Mr. Helmersen from Finland (neighbourhood of the lake of Ladoga &c.), (1867); by Messrs. Böger and Reusch from near Christiania (1874) &c.

From India only one case is reported, as far as the author knew, by the Missionary Mr. Krick from the river bed of the Brahmaputra, near the Tibetan boundary (1857). Major Godwin-Austen, however, informed him that he has seen similar forms to these in the Naga-Hills, some of them very deep and narrow.

Mr. H. F. BLANFORD said that one of his earliest recollections as a student of Geology was precisely that explanation of the formation of pot

holes which Dr. Feistmantel had brought forward, and up to the present moment he had been unaware that any competent geologist had questioned its validity. The phenomena was indeed exceedingly common and its explanation generally obvious. The most striking circumstance connected with pot-holes was the great depth they occasionally attain to, with a very small diameter.

Dr. FEISTMANTEL said he doubted very much whether Mr. H. F. Blanford's statement, that these pot-holes are exceedingly common, is correct; otherwise they would have been more frequently noticed and described, and authors like Nordenskjöld, Jackson, Collegno, Kutorga, Helmersen, Böger and Reusch would not have devoted special papers to their description; and if they were so very common in India, some of the Officers of the Geological Survey, who visit different parts of India, would have observed them and we should find altogether more information about them—if, however, it was a fact that they are so common he would be very much obliged to Mr. H. F. Blanford if he could furnish him with more positive information about their occurrence, their size, &c., than is contained in the simple assertion "that they occur" which could be found in any Handbook of Geology, he did not, however, consider this general description sufficient, especially when he saw that the authors above named had devoted special monographs to these phenomena and taken the trouble to explain the different causes of formation, which they certainly would not have done if pot-holes had been so common, or always so apparent as Mr. Blanford seemed to think, and he would recommend these papers to Mr. Blanford's consideration.

As regards the occurrence of pot-holes in European streams, it is certain that they are not quite so common; Dr. Feistmantel had himself visited many streams but had seen no pot-holes and the few scattered communications about them would show that they are not so frequent, except only in certain regions.

The chief point Dr. Feistmantel intended to be shown in his paper, was that the polished surfaces of the rocks and the longitudinal furrows, were, in the cases noted, produced by water action and not by ice; and in the paper he also shows still another cause of polishing and scratching and gives some notes regarding a glacial time in the Talchir (Damuda) period.

To Mr. Blanford's questions whether there were any pot-holes explained by glacier action he would reply that he did not mean that they were produced by glacier action, but that the origin of some of them is put back so far as to the times of the glacial period—and this is indeed so, as shown in Messrs. Böger and Reusch's paper on Giants'-Kettles from near Christiania.* The great Russian geologist, Mr. Helmersen, also speaks of

* * Quart. Journ. Geolog. Soc. 1874., p. 750, und Zeitschrift der Deut. Geol. Ges. 1874, p. 783, Pts. XXII—XXVIII.

some of the pot-holes described by him as produced during the diluvian period.*

The explanation brought forward by Mr. Blanford, is the same as Dr. Feistmantel intended to show in his paper and he had never doubted it, but it is not, however, always so simple; and, as he had said distinctly, his observations were a contribution to those instances of pot-holes produced by running water. Another reason he had for describing the pot-holes was to show the other phenomena combined with them, especially the polished surfaces of rocks and longitudinal furrows in the river bed, which resemble so much those produced by glacier action, though they are here apparently produced by water only. Polished and scratched surfaces are not therefore always to be considered as necessarily produced by ice action.

He was much interested in this question and would be greatly obliged to any body who would give him positive information (measurements and, if possible, drawings) about the pot-holes in India.

DR. RÁJENDRALÁLA MITRA remarked that the excavations shown on the plates laid on the table were very like what he had seen on the Ásvathámá rock at Dhauli near Cuttack, at Khandagiri and at Behar. Similar excavations had been noticed by antiquarians at Gírnár on the western coast, and in the neighbourhood of other ancient sites of Buddhist monasteries, and they had hitherto been believed to be artificial. Major Markham Kittoe took the Ásvathámá excavations for mortars in which the Buddhist monks, he thought, used to pound medicines for men and cattle. This opinion had been accepted by James Prinsep. Dr. Mitra could not make out from the drawings the size of the holes, but those he had seen were from one to two feet in diameter and eight to ten inches in depth.

MR. H. F. BLANFORD observed that Dr. Rájendralála Mitra probably referred to something quite different from pot-holes.

THE PRESIDENT remarked that he recollected a similar hole worn in an isolated boulder or block of granite lying in the bed of the Sutlej, near the Waughton bridge over that river in Kumaon. The block stood considerably above the present ordinary water level and probably formed part of a fall of rock which had at some former period fallen into the river and dammed the water to a higher level; this block was pierced by a hole reaching from the surface to near the bottom, and the impression on his mind at the time was that it had clearly been bored out by a pebble working in an eddy when the river was at a higher level. But it was many years since he had seen this block.

See Helmersen: *Das Vorkommen und die Entstehung der Riesenkeessel in Finnland*; *Memoires de l'Acad. Imp. de St. Petersburg*, 1867, Vol. XI, Ser. 7., with 3 plates. Also Vogt, *Geologie*, Bd. II., p. 191.

5. *The Mythic History of the God Viráj.*—By G. S. LEONARD.

(Abstract.)

The divine personage of Viráj—self manifest, who forms one of the ten supernatural beings, and objects of adoration, in the scale of the creative agents, the Demiurgoi of the Vedanta and Platonic theories, is considered in the various lights of history, mythology, and theology, in all of which he makes a conspicuous figure in the Hindu scriptures.

Though the discordant and contradictory accounts given of his genesis, and of his historical and mythological traditions in the Puráṇas, make it extremely difficult to form a correct idea of his personality, he is, however, historically found to be the first male being in creation, and in that respect stands in the relationship of the progeny of Brahmá, the great creator of the universe and progenitor of Manu, and other patriarchs of mankind called by their patronymic Vairájás. He is mythologically identified with the Hindu Trinity composed of Brahmá, Vishnu, and Sivá, and sometimes of Ganesha also, of which some instances are adduced from the Sástras. He is theologically described as one of the manifestations of the hypostases or attributes of god inherent in nature, as its vivifying principle. He is further considered in a philosophical light as the automaton, the motive power or moving force of nature, and his poetical and mystical representation as the *anima mundi* the mundane soul, and that of his consort Satarúpá (centiforma), as *corpus mundi* or body of the material world, is also shown, and identified with Múla-prakrit or primary matter, or plastic nature of Sánkhyā philosophy and the goddess Sakh of mythology. Virájism is then vindicated against the charge of Pantheism, idolatry or any kind of material worship, and his religion is proved to be a purely mental one, and he himself is shown as an object of spiritual worship among all Bráhmans, as the God of Nature, apparent in the universal frame without any visible image or temple dedicated to him, except the human heart which alone is endowed with the power of receiving his infinite and glorious image and reflection.

The modification of Viráj into mahá and kshudra or major and minor forms, is also considered, in comparison with the theories of macrocosm and microcosm of European philosophers.

At the close of the meeting the PRESIDENT read the following extract of a letter from Mr. Grote and announced that the Council had agreed to accept Mr. Moore's kind offer and had asked Mr. Grote to be so good as to arrange for the publication of an extra part in London in the same manner as had been done with the Blyth Catalogues.

London, January 31st.

MY DEAR WATERHOUSE,—The question on which I told you last week that I should address your Society's Council concerns the publication of the novelties which have been found in our late friend Atkinson's Cabinet of *Lepidoptera*. The entire collection has gone to Germany, having been purchased by Standinger of Dresden, who has, however, left with Moore of the Indian Museum a selection of novelties among the Nocturnals, with a view to their being named and described. The comparatively few novelties among the Diurnals have fallen into Hewitson's hands and some of these have already been described in the *Entomologist's Monthly Magazine* for December.

Moore tells me that he finds some 650 species of Nocturnals for description thus:

Bombyces,	200
Noctuae,	200
Geometridae,	200
Pyrallidae,	50

on the first of these groups he is already engaged, but it will take him some time to work out so many new species. The India Office catalogues having been for a time suspended he has asked me whether your Society would undertake to publish his descriptions as a memorial of your late Secretary. He estimates the cost of such a publication at about £142, which includes that of 8 plates uncoloured. Moore, who edited the Horsfield official catalogues and is well up in Indian entomology, offers his editorial labours gratis. I too offer my assistance in seeing the work through the press, and will endeavour to find materials for a short notice of Atkinson's scientific career and of his publications in the Zoological Society's Proceedings, to form an introduction such as I contributed to your Extra number for Blyth's Burmah catalogues. I have rather regretted that the labours of such a zealous collector of Indian *Lepidoptera* should appear to be overlooked by the Society which he so long served. Doubtless many of his discoveries would have been long ago made known through the Society's Journal if he had more leisure and fuller access to the figures of already described species. It is still open to the Council by accepting Moore's offer to secure for the Society and for Atkinson's Memorial the credit of first making his discoveries known to the entomological world.

LIBRARY.

The following additions have been made to the Library since the Meeting held in February, last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS

presented by the respective Societies or Editors.

Bombay. The Indian Antiquary,—Vol. VI, Pt. 65, 1877.

Sir E. C. Bayley, K. C. S. I.—Notes on Gupta Coins. *Dr. G. Bühler*—A new Grant of Govinda III., Rāthor. *J. F. Fleet*.—Sanskrit and old Canarese Inscriptions, Nos. 17 and 18.

Calcutta. Geological Survey of India,—Memoirs, Vol. XIII, Pt. 2, 1877.

Ball.—Geology of the Rajmehal Hills.

———.———.—Records, Vol. X, Pt. 1, 1877.

W. T. Blanford.—Geological Notes on the Great Indian Desert between Sind and Rājputāna.

Copenhagen. Nordisk Oldkyndighed og Historie,—Aarboger, Pts. 1 to 4, 1875, and Pts. 1 and 2, 1876.

Leipzig. Der Deutsche Morgenländische Gesellschaft,—Zeitschrift, Band 30, Heft 3, 1876.

D. H. Müller.—Die Harra-Inschriften und ihre Bedeutung für die Entwicklungsgeschichte der südsemit Schrift.

Liverpool. The Literary and Philosophic Society of Liverpool,—Proceedings, No. 30, 1875-76.

Dr. T. Inman.—"On a Means employed for removing and erecting Menhirs. *A. Morgan*.—On the Khasi Hill Tribes of North-eastern Bengal, and on the Geology of the Shillong Plateau. *E. Nicholson*.—On Indian Snakes. *A. E. Nevins*.—On the Method of correcting the rate of a Marine Chronometer for changes of Temperature, according to Mr. Hartnup's laws, with Tables and Explanations for facilitating the Computations of the same Corrections."

London. The Athenæum,—Nos. 2572 to 2574, 1877.

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A. E. Hippiusley.—The Abbé Armand David's Travels in China. *H. P. Malet*.—The Age of the Earth.

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Lord Lindsay.—Note on a Method of obtaining Equatorial Motion by means of a simple addition to an Altazimuth Stand.

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No. 174. *G. Dowdewell*.—On the Behaviour of the Fixed Elements of the Connective-tissue of the Tongue in Inflammation.

No. 175. *W. Crookes*.—Experimental Contributions to the Theory of the Radiometer.

Paris. *Journal Asiatique*,—7^{me} Série, Tome VIII, No. 2, 1876.

Mr. S. Guyard.—Théorie nouvelle de la métrique Arabe, précédée de considérations générales sur le rythme naturel du langage.

———. Société de Géographie,—Bulletin, Décembre, 1876.

J. B. Paquier.—Les explorations russes et anglaises dans l'Asie centrale (avec carte). L'Abbé Durand.—Les Indes portugaises. L'Abbé Desgodins.—Territoire de Bathang.

Torino. Reale Accademia delle Scienze,—Atti, Vol. XI, Dis. 1 to 6, 1875-76.

Dis. 1. Mosso.—Sopra un nuovo metodo per scrivere i movimenti dei vasi sanguigni nell'uomo. Zucchetti.—Memoria relativa alla scala delle velocità pel moto uniforme dell'acqua nei canali.

Dis. 4. Salvadori.—Intorno al tipo della *Goura* ^{Scheepmakeri}, Finsch, ed agli esemplari del genere *Goura* raccolti dal D'Albertis nella penisola orientale della Nuova Guinea, ed attribuiti alla medesima specie. Intorno alla identità Specifica del *Sericulus xanthogaster*, Scheg. e del *Xanthomelus aureus*. Lin.

———. ———, —Memorie, 2nd Series, Tome 28.

Zoologia del viaggio intorno al globo della R. Fregata Magenta, durante gli anni 1865-68. Malacologia (Gasteropodi, Acefali e Brachiopodi): di Cesare Taparone-Canefri. Epatiche di Borneo, raccolte dal Dott. O. Beccari nel ragiate di Sarawak durante gli anni 1865-66-67; descritte dal Dott. G. de Notaris.

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presented by the Authors.

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———. The "Oriental Sore" as observed in India. A Report, 8vo., Calcutta, 1877.

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The Indian Antiquary, Vol. VI, Pt. 65.

GOVT. OF INDIA, HOME DEPT.

Records of the Geological Survey of India, Vol. 10, Pt. 1, 1877.

GOVT. OF BENGAL.

The Vendidad, translated into Gujerati by Kavasji Edalji Kanga. 8vo., Bombay, 1874.

The Book of Arda Viraf with a Glossary and Index. By Dr. M. Haug and Dr. E. W. West.

GOVT. OF BOMBAY.

Sketch map of Dardistan and neighbouring countries. *

GOVT. OF THE PUNJAB.

Report on the Administration of the Land Revenue Dept. of the Central Provinces for 1875-76.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Records of the Geological Survey of India, Vol. 10, Pt. 1, 1877.

DEPT. OF REVENUE, AGRICULTURE AND COMMERCE.

General Report on the Topographical Surveys of India and of the Surveyor General's Dept. for 1875-76. By Col. H. L. Thuillier, C. S. I.

General Report on the Operations of the Revenue Surveys of India for 1875-76. By Colonel D. C. Vanrenen, R. A.

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General Report of the Operations of the Marine Survey of India from its commencement in 1874 to the end of the Official year 1875-76. By Commander A. Dundas Taylor.

List of Light-Houses and Light-Vessels in British India including the Red Sea and Coast of Arabia, corrected up to January 1877. By R. C. Carington.

COMMANDER A. DUNDAS TAYLOR, SUPT. OF MARINE SURVEYS.

The Damathat, or the Laws of Menoo, translated from the Burmese by D. Richardson. 2nd Edition, 8vo., Rangoon, 1876.

H. KRAUSS, Esq.

Tagore Law Lectures, 1875-76. The Law of Mortgage in India. By Rashbehary Ghose, M. A.

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TRUSTEES OF THE BRITISH MUSEUM.

Introduction to the Nannul. The Tamil text and English Translation by the Rev. H. Bower.

REV. F. FOULKES.

Meteorological Observations from St. Xavier's College Observatory for 1876.

THE REV. F. LAFONT.

PERIODICALS PURCHASED.

Bombay. The Vedarthayātṇa or an attempt to interpret the Vedas, Pt. I. No. III, 1876.

Calcutta. The Indian Medical Gazette,—Vol. 12, No. 3, 1877.

Leipzig. Annalen der Physik und Chemie,—Band 8, Stück 2.

F. Auerbach.—Untersuchungen über die Natur des Vocalklanges. E. Lommel.—Ueber die Interferenz des gebeugten Lichtes.

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No. 7. *La Langue et la Littérature Hindoustanies en 1876. Revue annuelle* par M. Garcin de Tassy.

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No. 108. *J. Wood-Mason*.—Description of a new Species of *Mantida* with Pointed Eyes. —On a Species of *Iapyx*. On some remarkable Species of *Mantida*. *Rev. T. R. R. Stebbing*.—On some new and little-known Amphipodous Crustacea. *G. E. Dobson*.—Description of a new Species of *Vesperugo* from Zanzibar.

No. 109. *W. O. Hewitson*.—Descriptions of 25 new Species of *Hesperidae*. *A. G. Butler*.—On *Rhopalocera* from Japan and Shanghai with descriptions of new Species. *J. Wood-Mason*.—Descriptions of new Species of *Blattida* belonging to the Genus *Panesthia*.

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———. The London, Edinburgh, and Dublin Philosophical Magazine,—Vol. 2, Nos. 13 and 14, and Vol. 3, No. 15.

No. 13. *G. Chrystal*.—On Bi- and Unilateral Galvanometer Deflection. *W. Ackroyd*.—Selective Absorption. *Lord Rayleigh*.—On the Resistance of Fluids.

No. 14. *A. M. Mayer*.—Researches in Acoustics, No. 8.

No. 15. *W. Spottiswoode*.—Description of a large Induction-Coil. *Lord Rayleigh*.—On a permanent Deflection of the Galvanometer-needle under the influence of a rapid series of equal and opposite induced Currents.

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No. 1263. *F. E. Thicke*.—Ventilation of Rooms generally, and the Way to make Workmen's Cottages comfortable, warm and healthy.

No. 1264. *A. Burrell*.—Indian Tea Cultivation, its Origin, Progress, and Prospects. Reports on the Government Chinchona Plantations in India.

No. 1265. *C. T. Kingzett*.—On some Processes of Nature's Hygiene leading to Improvements in the Production of Antiseptics, Disinfectants and Albumen of Commerce. *Prof. Barff*.—Zinc White as Paint and the Treatment of Iron for the prevention of Corrosion.

No. 1266. *J. Danvers*.—Indian Railways. *Sir J. Lubbock*.—Certain Relations between Plants and Insects.

Nature, Vol. 15,—Nos. 380 to 382.

New Haven. The American Journal of Science and Arts,—Vol. 12, Nos. 71 and 72.

No. 71. *C. A. Young*.—Observations on the Displacement of lines in the Solar

Spectrum caused by the Sun's rotation. *A. M. Mayer*.—Researches in Acoustics. *O. C. Marsh*.—Notice of new Tertiary Mammals.

No. 72. *O. N. Rood*.—Experiments on the nature of the force involved in Crookes' Radiometer. *J. W. Dawson*.—On a Recent Discovery of Carboniferous Batrachians in Nova Scotia. *O. C. Marsh*.—Principal Characters of the American Pterodactyls.

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Octobre. *M. Berthelot*.—Contributions pour servir à l'histoire des matières explosives. *M. F. M. Raoult*.—Influence de l'acide carbonique sur la respiration des animaux. *M. Cl. Bernard*.—Sur la formation du sucre dans le sang des animaux. *M. J. L. Smith*.—Recherches sur les composés de carbone que l'on rencontre dans les météorites.

Novembre. *M. le Dr. P. L. Panum*.—Le poison des matières putrides, les bactéries, l'intoxication putride et la septicémie.

Comptes Rendus,—Tome 83, Nos. 19 to 24; Tome 84, Nos. 4 to 6.

Tome 83, No. 20. *MM. E. Guignet et G. Ozorio de Almeida*.—Sur un fer météorique très-riche en nickel, trouvé dans la province de Santa-Catharina (Brésil.)

No. 21. *M. Berthelot*.—Nouvelles recherches sur les phénomènes chimiques produits par l'électricité de tension. *M. Fordos*.—Sur un procédé de recherche de la fuchsine dans les vins. *MM. P. Guyot et R. Bidaux*.—Note sur la recherche de l'acide rosolique en présence de la fuchsine. *MM. V. Feliz et E. Ritter*.—Nouvelles recherches sur l'action de la fuchsine non arsénicale, introduite dans l'estomac et dans le sang. *M. G. Hayem*.—Note sur l'action du fer dans l'anémie. *M. P. Picard*.—Recherches sur l'urée du sang.

No. 22. *F. A. Abel*.—Sur la composition du coton-poudre. *M. V. S. M. van der Willigen*.—De la force portative des aimants en fer à cheval. *M. Fordos*.—Deuxième Note sur la recherche de la fuchsine dans les vins. *M. A. Pierret*.—Recherches sur l'origine réelle des nerfs de sensibilité générale dans le bulle rachidien et la moelle épinière. *M. E. Duclaux*.—De l'action physiologique qu'exercent sur les graines de vers à soie, des températures inférieures à zéro. *M. J. Chatin*.—Sur la structure du bâtonnet optique chez les Crustacés. *M. E. Ferrière*.—Observation de trombes descendantes faite au cap d'Antibes, le 21 Novembre 1876.

No. 23. *M. P. Pichard*.—Productions de carbonate de soude par l'action du chlorure de sodium en dissolution sur les carbonates de chaux et de magnésie en présence de matières végétales. *M. Carbonniere*.—Mœurs des poissons le Gourami et son nid.

No. 24. *M. E. Faisa*.—Recherches sur la structure le mode de formation et quelques points relatifs aux fonctions des urnes chez le *Nepenthes distillatoria*. *M. A. Redier*.—Note sur la correction des variations de marche des pendules astronomiques, provenant des différences de pression atmosphérique. *M. P. Picard*.—Recherches sur l'urée du sang.

Vol. 84, N^o. 4. *MM. de Quatrefages et Hamy*.—Craniologie des races Négrito et Négrito-Papoue. *M. Weddell*.—Sur l'avantage qu'il y aurait à remplacer la quinine par la cinchonidine, dans le traitement des fièvres intermittentes.

- No. 5. *M. A. Rosal*.—Note sur la stabilité des voûtes. *MM. L. Pasteur et Joubert*.—Sur les germes des bactéries en suspension dans l'atmosphère et dans les eaux. *MM. E. Fremy et Clémendot*.—Recherches sur l'irisation du verre. *M. Jarriant*.—Sur une nouvelle disposition des tiges de paratonnerres. *M. Gaudin*.—Sur les effets produits par l'introduction de corps étrangers au carbone, dans la préparation des charbons pour la lumière électrique.
- No. 6. *M. P. Regnard*.—Note sur la présence de l'armoniaque libre dans l'acier fondu. *MM. V. Feltz et E. Ritter*.—Des accidents immédiats déterminés par les injections de fuchsine pure dans le sang. *M. Bavay*.—Sur l'anguillule intestinale (*Anguillula-intestinalis*), nouveau ver nématode trouvé par le Dr. Normand chez les malades atteints de diarrhée de Cochinchine. *MM. O. Galeb et P. Pourquier*.—Note sur *Filaria hæmatica* (Hématozoaires). *M. Oustalet*.—Sur deux nouvelles espèces d'ibis, provenant du Cambodge.
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- No. 33. *M. A. Gautier*.—La Chimie des Plantes.
- No. 34. *M. J. Tyndall*.—La fermentation et ses rapports avec les phénomènes morbides.
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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL.

FOR APRIL, 1877.

The Monthly General Meeting of the Asiatic Society was held on Wednesday, the 4th April, at 9 P. M.

DR. T. R. LEWIS in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the author, a Historical and Statistical Memoir of the Ghazipur District, Pt. II. By Dr. W. Oldham, C. S.

2. From Capt. A. D. Taylor, Supdt. Marine Surveys, a Chart of Salang Island, (Junk Seylan) surveyed by Commander A. de Richelieu, H. M. Siamese Navy.

3. From Bábu Jogesh Chunder Dutt, twelve copper Coins, collected from Sarnáth, Banáras, and the Panjáb.

MR. BLOCHMANN said that the copper coins presented by Bábu Jogesh Chunder Dutt did not require particular notice. The oldest was a Bactrian copper coin, and the most recent a pice struck by one of the kings of Audh.

The following gentlemen duly proposed and seconded at the last Meeting were balloted for and elected ordinary Members—

I. J. Whitty, Esq.

The Rev. A. N. W. Spens.

The following are candidates for ballot at the next Meeting—

1. Mr. J. A. Bourdillon, C. S., Offg. Asst. Secretary to the Government of Bengal, proposed by Mr. C. J. Lyall, seconded by Mr. J. O'Kinealy.

2. Mr. W. Sandford, Head Asst. Office Chief Engineer, P. N. S. Railway, Lahore, proposed by Mr. M. Macauliffe, seconded by Mr. J. Gouldsbury.

The Hon. T. E. Ravenshaw, C. S., proposed by Colonel H. L. Thuillier, C. S. I., seconded by Capt. J. Waterhouse.

The following gentlemen have intimated their desire to withdraw from the Society—

Colonel H. Drummond, R. E.

Major Lord Ralph Kerr.

Mr. G. Nevill, (on leaving India).

Bábu Bhagabati Churn Mallik.

Owing to indisposition Mr. W. T. Blanford was unable to exhibit, as announced, the specimens of pottery, copper ornaments, flint flakes, &c., sent by Capt. Mockler from Balúchistán.

Mr. Blochmann exhibited several Arabic and Persian inscriptions, of which rubbings had been received from Mr. J. G. Delmerick, Dihlí, and Mr. J. R. Reid, C. S., A'zamgarh.

He said—The rubbings received from Mr. Delmerick formed two sets, one taken at Hiçár Firúzah, and the second, at Hápsí. The latter would be laid before the Society at the next meeting. Mr. Reid's rubbings were taken from various places in the district of A'zamgarh, and as nearly every village of the district had been visited by Mr. Reid, he was sure that there were no other inscriptions to be found there.

Hisár Firúzah.

The town of Hiçár Firúzah was founded in 757 H., or A. D. 1356, by Firúz Sháh III. of Dihlí, at a place formerly called Aránan, or, according to some MSS., Rás, in connection with his canal. Below the castle of the new fort (*hiçár*), he made a wide reservoir, and filled it with water from his canal. *Vide* Cunningham, Arch. Reports, Vol. V, p. 142.

According to the *Zafarnámah*, Hisár Firúzah was visited by Timur on the 5th Rabí' I, 801 (15th Nov. 1398), who on the same day proceeded to Sarsutí, now called Sirsá, which was plundered and burnt. Bhatner had shared the same fate before, and Fathábád and Ahroní followed. 'Not a house was left standing'; the inhabitants were killed and the fugitives were pursued by cavalry. The district seems never to have revived from the ravages committed by Timur's soldiers.

In 811 H. (1408 A. D.), Sultán Muhammad wrested Hisár Firúzah from Qiwám Khán, to whom Khizr Khán, in 809, had given it. In 832 (1428-29 A. D.), Malik ush-sharq Mahmúd Hasan commanded the district; and in 838 (1434-35), Hisár was given to Iqbál Khán.

In 925 H. (1519 A. D.), it was taken by Bábar's troops from Hamíd Khán. The town and the district were shortly after set aside for the household of Prince Humáyún.

According to some authorities, Sher Sháh was born at Hisár (others, perhaps more correctly, say at Náranul), where his grandfather Ibráhím Khán Súr had taken service with Jamál Khán Sárangkhání.

On Humáyún's return from Persia, Hisár Firúzah became the appanage of Prince Akbar. Akbar afterwards gave it for the same purpose to Prince Salím; Jahángír gave it to Prince Khumwáj; and Sháhjahán, in 1043 (1633 A. D.) gave it to Dará Shikoh.

During the reign of Akbar, Hisár Firúzah is mentioned as a mint-place for silver and copper coins. The district supplied the *ghí* for the imperial household, and was often visited as a favorite hunting-ground.

The *Tuzuk-i-Jahángírí*, *Pádsháhnámah*, and *Tazkirah-i-Saláftín-i-Oghatáiyyah*, mention the following Faujdárs of Hisár Firúzah—

In 1016 H. (1607 A. D.), Mubárah Khán Sarwání.

1018 H. (end of 1609), Saif Khán Bárha.

1023 H. (1614), Hashim Khán.

1025 H. (1616), Muhammad Husain, brother of Khwájah Jahán.

1042 H. (1632), Kripá Rám Gaur.

1043 H. (1633), Muhammad 'Alí Beg.

1129 H. (1717), Salábat Khán Bárha.

Disturbances seem to have been frequent in the district. In 1614 A. D., we hear of disturbances caused by Dalpat Singh (*A'in Translation*, I, p. 359); in the last year of Sháhjahán's reign, Lashkar Khán had to quell disturbances in Hisár and Bíkánír; and in 1131 H. (A. D. 1718), Najm-uddín 'Alí Khán was sent to Hisár by the emperor Farrukh-Siyar to keep rebels in check.

Of Hisár celebrities, I find the following—

1. Shaikh Junaid, a saintly descendant of the great Shaikh Faríd-ud-dín Shakkar-ganj of Dípálpúr (the old Ajodhan). Junaid, according to the *Khazinat-ul-Afjá* (p. 398), lived and died at Hisár, where his tomb is still shewn. He wrought many miracles, and was also known for the extraordinary rapidity with which he could write. He died in 900 H. (1494 A.D.). *Vide* below Inscriptions III and IV.

2. A poet who received from Akbar the *nom-de-plume* of Mihnati, 'the drudge'. He was Qází of Sarhind, where he died. *Baddoni* (III, 387) gives a few of his verses.

3. Dáúd Khán, the conqueror of Palámau and founder of the town of Dáúdnagar in Southern Bihár, where his descendants still live. He died in 1084 H. (1673 A. D.). A biographical notice by me will be found in the *Indian Antiquary*, Vol. I, p. 77.

Regarding the various Jat tribes in Hisár Firúzah, *vide* Elliot's *Races of the N. W. Provinces*, by Beames, Vol. I, p. 130; and regarding the western boundary of the district, and its parganahs, Vol. II, pp. 17, 18, 133.

Mr. Delmerick's Hisár inscriptions amount to twelve; of No. I he sent a reading. Among the inscriptions the reign of Humáyún is well represented. I now give my readings and translations.

I.

From a mosque near the Taláki (طلاقي) gate, Hisár, west (metre, long *ramal*).

يا حافظ بسم الله الرحمن الرحيم يا حفيظ
مسجد جامع مرتب شد بعون ذو الجلال * همچو كعبه در كمال و همچو قبله در جمال
نزد او چاه معظم همچو زمزم چشمه دار * آبهاو همچو دم عيسی است در رف ملال
این دو جا شد ز امر بی فاطمه خاتون كه آوست * مادر خان معظم قطبخان با كمال
در زمان دولت بهلول شاه دین پناه * آنكه مثل او نباشد هیچ شاه در قنال
دوبی روز از جمادی الاولین تاریخ بود * و از كه هجرت گذشته هشتاد و هفتاد سال
سنه ۸۷۰

In the name of God, the merciful, the clement !
O Preserver ! O Guardian !

1. The Jámí' Mosque was erected with the help of the Lord of glory ; (it is) like the Ka'bah in perfection, like the *Ḳiblah** in beauty.

2. Near it is a large well with a spring like the Zamzam ; its water, like the breath of Christ, removes sickness.

3. Both were built by order of the lady Fátimah Khátún, who is the mother of the mother of the great Khán, the distinguished *Ḳuṭb Khán*,

4. In the time of the reign of Buhlúl Sháh, the protector of the faith, of him like whom no other king is in battle.

5. The date is the 2nd day of Jumáda I, and 870 years had elapsed since the time of the Flight. [21st December, 1465.]

II.

From the Mausoleum outside the Nágorí Gate, South. The rubbing measures 8 ft. 2 in. by 5 in.

بسم الله الرحمن الرحيم
لا اله الا الله محمد رسول الله صلى الله عليه
نقل این سلطان المشايخ و الاوليا شيخ محمد بن شيخ محمود چشتي فی التاسع
من شعبان سنه اثني وتسعين و ثمانمائة ١١

In the name of God the merciful, the clement !

There is no God but Allah, Muhammad is Allah's prophet, may God bless him !

The departure of this king of the Shaikhs and the Saints, Shaikh Muhammad, son of Mahmúd, the Chishtí, took place on the 9th Sha'bán, 892 [31st July, 1487].

* As *Ḳiblah* is here opposed to the Ka'bah, it seems to refer to Jerusalem (*Bait-ul-Makdud*).

III and IV.

These two inscriptions come from the same Mausoleum as Inscription II. They measure 6 ft. 10 in. by 9 in., and 6 ft. 2 in. by 5 in., respectively. It looks as if the builder Junaid was the same as Shaikh Junaid, mentioned by me above among the 'Hisár Celebrities'. The date of his death, as given in the *Khazínah* would be too early; but the fact that he is called 'Ajodhani' seems to prove the identity.

The spelling 'Achodhani' for 'Ajodhani' is quite clear in the rubbing.

بسم الله الرحمن الرحيم

الغرة من ربيع الاول سنة ٩٢٧ وعشرين وتسعمائة بانيه جنيد بن چندن

On the 1st Rabi-ul-awwal, 927. The builder is Junaid, the son of Chandan. [9th February, 1521].

الغرة من شهر ذي القعدة سنة احدى وثلاثين وتسعمائة بانيه جنيد بن چندن

بن محمود اچودھنی

On the 1st Zí Ka'dah, 931. The builder is Junaid, son of Chandan, son of Mahmúd, of Achodhan. [20th August, 1525.]

V.

From a mosque outside the Dihlí Gate, situate in the Sarái Nathúá Bhatyará (a baker). Four lines, 2 ft. 5 in. by 1 ft. 3 in.

بسم الله الرحمن الرحيم

قال النبي عليه السلام من بني مسجد لله بني الله تعالى له بيتا في الجنة بعد
توفيق الله الملك العالم وبركت حضرت رسالت عم در عهد ميمون ودولت ايام
افزون خدايگان ناصر جهان عادل الزمان سلطان الهند و الخراسان رافع رايات
الجاهدات و المغازي محمد همايون پادشاه غازي خلد الله ملكه و خلافته و ابد
على العالمين عدله و رافته بنا كرد و مزين گردانيد اين مسجد مرغوب بعمارت خوب
بمرضات حضرت معبود بندي اميدوار رحمت پروردگار المستعين بالله و لرحمان
المنجي نظر قلبي ابن شاه قلى خان المعروف نظام الدين خان تركمان زاد الله تعالى
ما اعطاه و بلغه الى ما يتجناه بحرمة [سيد] الابرار و الاخيار مؤرخا في الرابع من شهر
شعبان ختمه الله بالظفر و الامان سنة ٩٣٩ كاتب حروف عبد الله يوسف احمد
بن زكن الدين

In the name of God, the merciful, the element !

The prophet (upon whom be peace !) says, 'He who builds a mosque for God, will have a house built for him by God Almighty in Paradise. After the grace of God, the King, the omniscient, and the blessing of the Lord of prophethip (on whom be peace !), in the auspicious time, and the day-increasing reign of the sovereign, the helper of the world, the just one of the age, the king of India and Khurásán, who raises the standard of holy strife and war, Muḥammad Ḥumáyún, Pádsháh-i-Ghásá,—may God perpetuate his reign and spiritual rule and extend over all ages his justice and his compassion !—this fine mosque was built and adorned, in beautiful struc-

ture, in order to please the Lord who is adored, by the slave who hopes in the mercy of the All-nourisher, who seeks help from God and takes refuge with the Merciful, Nasar K ulí, son of Sháh K ulí Khan, who is known as Nizám-uddín Khán, the Turk-mán,—may God increase what He has given him and bring him to what he desires, for the honor of the chief* of the pious and the saints! Dated 4th Sha'bán (may God allow the month to end in victory and security!), 939. [1st March, 1533.]

The writer of these letters is 'Abdullah Yúsuf Ahmad, son of Rukn-uddín.

VI.

From the Jámí' mosque of Hisár. The inscription consists of nine lines, and measures 1 ft. 11 in. by 1 ft. 5 in.

بسم الله الرحمن الرحيم
وان المساجد لله فلا تدعوا مع الله احدا وانه لما قام عبد الله يدعوه كادوا يكونون
عليه لبدا * قال عايه السلام من بني لله مسجدا ينبغي به وجه الله بني الله له في
الجنة مثله * تمام شد اين مسجد در ايام دولت شهنشاه الاعظم والخواقان المعظم
مالك رقاب طوايف الامم من الهند والترك والعرب والعجم السلطان الفاضل
الكامل الولي الوالي والخواقان العادل العلى العالى الذى وجب اطاعته كاطاعة الله
ورسوله بحكم اطيعوا الله واطيعوا الرسول واولى الامر منكم حافظ بلاد الله ناصر
عباد الله رافع رايات المجاهدات والمغازى محمد همايون بادشاه غازي خلد الله
تعالى ملكه وفي بحار اللطف اجرى فلكه بسعي جناب سعادت فرجام زبدة فضلاء الانام
نتيجة امراء العظام امير محمد بن عالى جناب امارتآب مهلكت پناه نظام الدين
بيك ميرك بن جناب المغفور المبرور خوشكيلدى * * * بن جناب مغفرت مآب
* * * * * فردوس مكاني *

شد بنای مسجد بهر خدا اندر حصار * کورنیه القدر آمد همچو کیوان سربلند
بس که عالی قدر وکیوان هیئت و مرزون فتاد * هر که دید افتاد اورا طرح این مسجد پسند
چون پسند آمد تمام اهل دل تاریخ او * باب * * * * رحمت گفته اند

سنه ۹۴۲

کاتبه و حائله نظام *

In the name of God, the merciful, the clement!

'The mosques belong to God. Do not associate any one with God. When the servant of God rose up to pray to Him, it nearly happened that they [the *jims*] pressed on him in crowds' [Korán, lxxii, 18, 19.]. The Prophet says 'He who builds a mosque for God desiring thereby God's honour, will have one like it built for him by God in paradise.' This mosque was finished during the time of the reign of the great king of kings, the exalted prince, the master of the necks of crowds of nations among the Indians, Turks, Arabs, and Persians, the accomplished Sultán, the perfect, the chief, the ruler, the just prince, the high, the exalted, whom to obey is as necessary as to obey God and the Prophet, according to the Korán verse 'Obey God and obey the Prophet

* *Sayyid*. The word is left out in the inscription; but the phrase is common, and the conjecture is easy.

and those who have authority among you,' the guardian of God's countries, the helper of God's servants, who raises the standard of holy strife and war, Muhammad Humáyún, Bádasháh-i-ghází—may God Almighty perpetuate his kingdom and guide his ship in the seas of His favor!—through the exertion of the auspicious dignitary, the cream of the accomplished among men, the issue of great Amíra, Amír Muhammad, son of the distinguished noble, the meritorious Nizám-uddín Beg Mirak, son of the pardoned and purified Khushkildí * * * son of * * * of Bábar.

1. A mosque has been built in Hisár for the sake of God, which is as high in dignity as the seventh heaven.

2. Because it is high in dignity, and has the aspect of the seventh heaven, and has turned out well adjusted, every one who saw it has approved of the style of this mosque.

3. Because all people of sense approved of it, its chronogram is * * * * (illegible). A. H. 942 [A. D. 1535-36.]

The writer and composer is Nizám * * *

VII.

From a Maḡbarah outside Hisár, about a mile eastward, near the house of Col. Foster, Dy. Commissioner, Hisár. 1 ft. 1 in. by 1 ft. 2 in.

بسم الله الرحمن الرحيم

در عهد میمون و دولت محمد همایون خلد ملکه و سلطانہ و اعلیٰ امر و شانہ
این عمارت * * * والتو خان * * بن میر * * بن سلطان ملک بک در غرة ماه
رمضان سنہ ثلاث و اربعین و تسعمایہ * * شد ॥

In the auspicious time and reign of Muhammad Humáyún—may God perpetuate his kingdom and his rule and elevate his condition and dignity!—this building was * * by Wáltú Khán * * son of Mír * * son of Sulṭán Malik Beg, on the 1st Ramazán 943.

Along the right hand side of the inscription the following words are found—

این * * گنبد * * بست هزار تنگہ * * باهتمام شیخ منور بن قاسم تمام شد ॥

This * * vault * * 20,000 *tāngahs* * * * was completed under the superintendence of Shaikh Munawwar, son of Qásim.

It is possible that the Wáltú Khán of this inscription is the Báltú Khán mentioned in my *Aín Translation*, Vol. I, p. 475, No. 207.

VIII and IX.

Both inscriptions come from the same Maḡbarah as No. VII. They measure 2 ft. 8 in. by 1 ft. 9 in. and 2 ft. 6 in. by 1 ft. 5 in., respectively.

بسم الله الرحمن الرحيم

در عهد میمون و دولت همایون سلطان الهند و الخراسان رافع رباب المعاهدات
و المغازی محمد همایون بادشاه غازی خلد خلافتہ این عمارت بقاریخ ماه رجب
رجب قدره سنہ اربع و اربعین و تسعمایہ تمام شد و این گنبد برتردی کوچک

بن میر برنطق مغل شده است و این جوان در لشکر گجرات شهادت یافت و مبلغ
پانزده هزار تنگه سیاه خرج شده است ||

In the name of God, &c. In the auspicious time and the august reign of the king of India and Khurásán, who raises the standard of holy strife and war, Muhammad Humáyún, Bádhsháh-i-ghází—may God perpetuate his rule!—this edifice was completed during Rajab (may the dignity of the month increase!) 944. [January, 1538]. And the vault was made for the sake of Turdí Bag Kújak, son of Mír Baranṭaq the Mughul; and this youth was killed in the Gujrát war. The cost was 15,000 black *tangahs*.

بسم الله الرحمن الرحيم

در عهد میمون و دولت همایون سلطان الهند و الخراسان رافع ریات اعجاهدات
و المغازی لجهاد الدین محمد همایون بادشاه غازی خلد خلافته بتاریخ ماه رمضان
سنه اربع و اربعین و [تسمایه] این عمارت از * * میر عاشق محمد بن میر شاه
علی شد و این جوان در لشکر گجرات شهادت یافت و مبلغ دوازده هزار تنگه
سیاه خرج شده ||

In the name of God, &c. In the auspicious time and august reign &c., [as above]—this edifice was completed during Ramazán, 944. [March 1538]. And this edifice was made on account of * * Mír 'Ashiq Muhammad, son of Mír Sháh 'Alí; and this youth was killed during the Gujrát war. The cost was 12,000 black *tangahs*.

X.

From a dome outside Hisár, about a mile to the east, inside the Commissariat godowns. 1 ft. 5 in. by 1 ft. 10 in. The poetry is execrable (metre, *Mutakárib*).

گل و خشت او مشک و عنبر مرشت	خوشا گنبد روضه چون بهشت
روان سلسبیل ز اشجار و کشت	ز انفاس باغش معطر دماغ
که تاریخ برگنبد آمد نوشت	دبیر—و فلک گشته برگرد او
سنه ۹۷۵	
که حکمش به بنیاد بنهاد خشت	هزار آفرین بر ابای یزید
کاتب کبیر	

1. How beautiful is the dome of the paradise-like mausoleum; its mortar and bricks are like musk and ambergris.

2. From the scent of the garden the brain is perfumed; and a Salsabíl (a spring in paradise) flows from its trees and meadow.

3. The secretary of heaven [Mercury] turned round it, when the date was written on the dome: A. H. 975 [A. D. 1567-68].

4. Much praise is due to Bá Yazíd, by whose order the bricks were placed on the foundation. Written by Kabír.

XI.

From a mosque in the yard of 'Sher' Buhlúl's mausoleum, outside Hisár, one mile to the south. The rubbing is 2 ft. 5 in. square, and the characters are in well-formed *Nasta'liq* (metre, long *ramal*).

پیروے شرع رسول مچنی عبد النبی
پیش سخن روضہ بہلول شاہ افکند طرح
مسجدے عالی کہ باشد مسکن اہل دعا
در ہزار و یکصد و شش یافت انہام این بنا

1. The follower of the law of the Prophet, the chosen one, 'Abd-unnabi, whose sight gives brightness to the mirror of the heart,

2. Erected before the courtyard of Sháh Buhlúl's mausoleum a grand mosque, which is to be the dwelling of worshippers.

3. A voice from heaven announced without difficulty the final hemistich, 'This building was completed in 1106. [A. D. 1694-95.]

XII.

From the Dargáh outside the Taláki gate. 1 ft. 2 in. by 6½ in. (metre, *Khafif*).

بسم الله الرحمن الرحيم
شاہ ایوان فقر اسمعیل یافت از حق برات بر فردوس
سال می جستم از خرد ناگاہ گفت ہاتف برقت در فردوس
نام حکاک پیر بخش ساکن بیگانیز فرمود مولوی امام بخش صاحب مہدائی
تخلص دہلوی سنہ ۱۲۳۶

1. The king of the palace of poverty, Ismá'íl, received from God an order on paradise.

2. I was searching for a chronogram, when a voice from my heart suddenly said, 'He went to paradise.' [A. H. 1236; A. D. 1820-21.]

The name of the engraver is Pír Bakhsh, an inhabitant of Bikanír. By order of Maulawí Imám Bakhsh Sháhí, whose *nom-de-plume* is Sháhbaí, of Dihlí.

Regarding Imám Bakhsh Sháhbaí, *vide* Garcin de Tassy, *Histoire de la Littérature Hindoue et Hindoustanie*, Vol. III, pp. 22 to 26.

For other inscriptions belonging to the neighbourhood of Hisár, *vide* my readings and translations of Mr. Delmerick's Abúhar and Sirsá Inscriptions, in *Proceedings, As. Socy. Bengal*, for March, 1874, p. 72 (where on l. 22 'uncle' must be corrected to 'father').

District A'zamgarh.

I.

From a Mosque in the village of Ganjahra, Parganah Muhammadábád.

در زمان شاہ عالم گیر دین پرور کرو رونق دین محمد هست افزون از قیاس
شد بنا از فیض خورشید گرم لامتقین مسجدے کزنور آن انجم نابد اقتباس

حاملان مرش گفتند از کمال کیست این گفتم از این الکمال است این کمال حق شناسی
 رفعت شانش به بیت الله میماند به فضل ذرؤ اوجش باوج آسمان کردہ مساس
 سال تاریخش چوپرسیدم ز پیر عقل گفت از محمد صالح است این مسجد احسن اساس
 سنہ ۱۰۹۹

1. In the time of the Emperor 'A'lamgîr, who fosters the faith, and through whose splendour the religion of Muhammad has increased beyond expectation,

2. This mosque was built for the pious through the kindness of the sun of generosity—a mosque from the radiance of which the stars borrow (their light).

3. The carriers of God's throne asked, 'What perfect man has done this'; and I said, 'This perfection of piety comes from the scion of perfection.'

4. Its exalted shape resembles the House of God [the *Ka'bah*] in excellence; the top of its summit touches the summit of the heaven.

5. When I asked for a chronogram, Genius [*pr.* the old man of thought] said, 'This mosque of excellent foundation was built by Muhammad Sâlih,' A. H. 1099. [A. D. 1687-88.]

I do not know whether the builder is the same as the Muhammad Sâlih who is mentioned several times in the '*A'lamgîrnâmah* and the *Mâdsir-i-'A'lam-gîrî*.

II.

From an old mosque at the ruined village of 'Kashbah,' properly Kāshbah Nigūn, Parganah Māhul.

بعد محمد ہمایون الفقیر محمد عطا بن دوست قلی کابلی سنۃ اربعین
 وتسعمایہ ۱۱

In the reign of Muhammad Humáyūn..... the poor Muhammad 'Atā, son of Dost Qulī, the Kābulī. A. H. 940 [A. D. 1533-34].

Sher Sháh spent some part of his early life in Nigūn.

III.

On a broken slab found in the village of Chakesar, Parganah Ghosí.

Chakesar was formerly the name of a parganah. It is now a tappá, and is included in Parganah Ghosí.

بنا شد مسجد جامع بفيض فضل رباني *
 بعد شاه فیروز آن شاه عالم ے بر شاہان *
 محراب و مسجد *
 بتا ربیع نبی بودست. هفصہ ہشت *

1. The Jāmi' mosque was built with God's blessing.....

2. In the reign of King Fīrūz, that king of the world who over all kings....

3. — niche and mosque....

4. According to the era of the Prophet it was in 7.8, that,

The left half of the slab is broken off. The characters of the inscription are the same as on the rich inscription of A. H. 815, published by me in Proceedings, A. S. Bengal, for March 1874, pp. 69, 70. On both inscriptions the word *kik* is spelt *ke*, though the metre shews that *ke* is short.

IV.

From a stone at the Dargáh of Pír Káshání in Muhammadábád Khás, Parganah Muhammadábád.

The rubbing is illegible, and the name of this saint from the town of Káshán (in Persia) is not known to me.

The following papers were read—

1. *Note on the old Manipurí Character.*—By G. H. DAMANT, C. S.,
Officiating Political Agent, Manipur.

(Abstract.)

The Manipurí alphabet appears to be a form of the Devanágari, and was, in all probability, introduced from Bengal along with Hinduism by some wandering *sanyási* in the reign of Charairongba (1700 A. D.). The alphabet is ill-adapted to the wants of the language, but is used by the 'maibees,' or priests, who keep up a national chronicle, in which every event of importance is recorded.

The number of Manipurí MSS. is exceedingly limited. Mr. Damant mentions five, and gives a facsimile, transliteration, and translation, of the first page of the 'Samsokgnamba.' *Vide* Journal and Proceedings for 1875.

The paper will appear in No. 1, of Pt. I, for 1877.

MAJOR GODWIN-AUSTEN said—There is but little doubt that the Manipurís are a mixed race drawn from the Hill-tribes that encircle the valley, particularly the Nága. Even now a certain intermixture of blood goes on through the connections formed by Manipurís with Hill women that come down into or live in villages contiguous to the valley, or take service in Manipuri households. He believed also that men of the Hill-tribes are admitted into the Hindu community.

2. *Descriptions of three new species of Birds belonging to the genera Pomatorhinus, Actinura, and Pellorneum, from Saddya, Assam.*—By Major H. H. GODWIN-AUSTEN.

(Abstract.)

This paper contains the descriptions of three interesting new forms recently collected by Mr. M. T. Ogle in the neighbourhood of Saddya,

Assam, viz., *Pomatorhinus stenorhynchus*, *Actinura Oglei*, and *Pellorneum pectoralis*.

The characters of some of the other specimens were briefly noticed, and the close relationship of *Actinura Oglei* with *Turdinus guttatus*, Tickell, from Tenasserim, pointed out. The other forms, probably new (further examination being necessary), were provisionally noted as *Ohleuasicus atroperciliaris*, *Abroinis flavogularis*, and *Turdinus Williamoni*.

3. *Description of two new Species of Freshwater Crustacea obtained by Mr. O. Limborg in the Houng-da-rau Valley, Tenasserim.*—By J. WOOD-MASON.

(Abstract.)

The author exhibited and read descriptions (i) of *Paratelphusa Limborgi*, which is said to differ from its near ally *P. Edwardsii* (from the streams of the flat country lying along the base of the hill-ranges of the N. E. Frontier of India) in the great development and prominence of the extraorbital angles and of the front, which latter is also broadly emarginate, in its slenderer legs, in the ungrooved condition of the 2nd joint of its external maxillipeds, &c., and (ii) of *Telphusa lobifrons*, in which the front is divided by a broad and deep indentation of its surface and by an emargination of its free edge into two lobes, themselves slightly emarginate, in which the external margin of the extraorbital tooth is equal in length to half the width of the front, in which the posterior margin of the carapace and the front are of equal width, &c.

The collection sent up by Mr. Limborg also contains numerous examples of *Telphusa Larnaudii*, A. M.-Edw., but none of *Paratelphusa Sinensis*—a form that abounds in the neighbourhood of Moulmein.

4. *Note on a case of Death by Lightning in a Mine, communicated by I. J. WHITTY, Esq., Supdt. of the Kurhurbari Collieries, Giridhi.*

A remarkable case of death by lightning in a mine has been communicated by I. J. Whitty, Esq., Supdt. of the Kurhurbari Collieries. The mine is a shallow one, worked by levels driven on the side of a flat-topped hill, only 20 feet from the surface, which is therefore the thickness of rock above the coal seam. The working-face, where the accident occurred, is about 130 feet from the opening. There were a number of miners in the drift at the time. Those near the entrance were unaffected. The two who were killed (a man and a woman) were at the working-face in adjoining galleries, separated by about 12 feet of coal. Two other miners nearest to the face were knocked down and severely stunned. They were all natives; and the only account that they could give of what occurred was, that sparks

seemed to come out of the pillar of coal between the two who were killed. They say they were not aware there was a thunderstorm going on.

Mr. Whitty states that no mark of any kind could be observed on the bodies, nor anywhere in the mine or on the tools lying about; but that a young *sal* tree standing as nearly as possible over the position of the accident was slightly damaged, and that in the ground at its base a hole, about one inch in diameter, seemed to have been formed by the lightning.

The little hill, or plateau, in which the mine is situated is one of a small irregular group in the centre of the coal-field, about 200 feet high. It is formed of the coal-measure sandstone. The drainage is thorough, and the mine was quite dry. From the presence of the workmen, the sides of the gallery and the air in it were probably damper than the rock. The tree, or other vegetation on the hill is scanty.

The accident occurred at about 1·30 p. m. on the 31st January. There had been no rain from 15th October to 12th January, when one inch of rain fell. There were some intermediate showers, and 0·96 fell on the 31st, the total for the month being 2·42 inches.

Mr. H. F. BLANFORD said that a lesson of great practical importance might be learned from the very remarkable case communicated by Mr. Whitty, *viz.*, the very low conductivity of rock *in situ*, unless saturated with water. Notwithstanding the enormous sectional area of the rock-conductor presented by the mass of the hill, so low was its conductivity that the discharge took place through the bodies of these unfortunate workmen, in sufficient quantity to kill two of them and injure others. Now, looking at the manner in which the great majority of the lightning rods attached to houses in Calcutta terminate below, we can fully understand that they must be useless or even worse than useless. There is one on a house occupied by the Bengal Club, which terminates on the top of a post, and at the very best, they generally leave about a foot of the lower end buried in ground which is kept pretty dry by the drainage into the Calcutta sewers. Such rods can offer no protection, and, as if to ensure their inutility, they never range to a sufficient height to command more than a protected radius of 3 or 4 feet. It is little wonder that we constantly read of houses which are provided with lightning rods being struck by lightning, the rod taking no part in the discharge.

The CHAIRMAN remarked that it not unfrequently happened that persons who had been killed by lightning manifested no outward sign of injury. Such was the case in an instance that occurred on the Calcutta maidan a short time since, where death had been instantaneous. Had it not been for the circumstance that the man happened not to be alone and that his companion though thrown down escaped with only temporary nervous derangement, the cause of his death must have remained a matter of

conjecture merely, as although the body was examined a few minutes after the occurrence, nothing could be detected indicative of the cause of death. Unfortunately our knowledge of the minute texture of the organs and tissues of the body is not sufficiently advanced to enable a definite opinion to be given regarding the precise cause of death in cases of this kind when unaided by circumstantial evidence.

In this case also there were no marks on the roadway suggestive of anything unusual having occurred, or to indicate the spot where the discharge had struck the ground.

LIBRARY.

The following additions have been made to the Library since the Meeting held in March last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS, *presented by the respective Societies or Editors.*

Berlin. Königliche Preussische Akademie der Wissenschaften,—Monatsbericht, Novembre, 1876.

Oldshausen.—Parthava und Pahlav, Mâda und Mâh, Mazdorân und Mâzanderân.
Boll.—Zur Anatomie und Physiologie der Retina.

Birmingham. Institution of Mechanical Engineers,—Proceedings, No. 6, October, 1876.

F. H. Lloyd.—On the Open Spray Tuyere, and other Blast Furnace Tuyeres.
J. Durie.—On Rope Gearing for the Transmission of Power in large Mills and Factories.

Geneva. La Société de Physique et d'Histoire Naturelle de Genève,—Mémoires, Tome 24, Pt. 2.

M. P. de Lorient.—Note sur quelques espèces nouvelles appartenant à la classe des Echinodermes.

Edinburgh. The Royal Society,—Proceedings, Session 1875-76,

J. MacGregor.—On the Electrical Conductivity of Stretched Silver Wires.

———. ———.—Transactions, Vol. 27, Pt. 4, 1875-76.

Dr. J. Donaldson.—On the Expiatory and Substitutionary Sacrifices of the Greeks.
Prof. C. Niven.—On the Stresses due to Compound Strains. *J. A. Brown*.—On the Decennial Period in the Range and Disturbance of the Diurnal Oscillations of the Magnetic Needle and in the Sun-spot Area. *Dr. J. Stark*.—On the Shedding of Branches and Leaves in *Coniferae*.

Leipzig. Deutsche Morgenländische Gesellschaft,—Zeitschrift, Band 30. Heft 4, 1876.

E. Haas.—Ueber die Ursprünge der Indischen Medizin, mit besonderem Bezug auf Susruta. *H. H. Müller*.—Himjarische Studien.

London. The Athenæum,—Nos. 275 to 277, 1877.

——. The Geographical Magazine,—Vol. 4, No. 3, 1877.

M. Venyukof.—Togographical Surveys in Asiatic Russia, during 1876.—

——. The Anthropological Institute of Great Britain and Ireland,—Vol. 6, No. 3, January, 1877.

W. L. Distant.—Notes on the Nicobar Islands. Signor S. M. D'Albertis' expedition to New Guinea. *M. J. Walhouse*.—Remarks on a Collection of Iron Arrow and Spear heads from Southern India. *H. Clarke*.—Note on Serpent and Siva Worship and Mythology in Central America, Africa, and Asia. *Dr. Gillespie*.—On Flint Cores as Implements.

——. Nature,—Vol. 15, Nos. 383 to 385, 1877.

——. The Royal Asiatic Society,—Journal, Vol. 9, Pt. 1, 1877.

E. Thomas.—Bactrian Coins and Indian Dates. *A. H. Sayce*.—The Tenses of the Assyrian Verb. *R. Friederich*.—An Account of the Island of Bali. *Major Mockler*.—On Ruins in Makrán. *S. L. Poole*.—Inedited Arabic Coins. *Prof. J. Dowson*.—Further Note on a Bactrian Pali Inscription and the Samvat Era. •*A. H. Schindler*.—Notes on Persian Belúchistán, from the Persian of Mirza Mehdy Khán.

——. The Royal Astronomical Society,—Monthly Notices, Vol. 37, Nos. 2 and 3, 1877.

No. 2. *W. M. Williams*.—Note on Prof. Langley's Paper on the direct effect of Sun-spots on Terrestrial Climates. *Rev. S. J. Perry*.—On some Diffraction Experiments of M. Ch. André, with reference to Astronomical Instruments, and the General Theory of this Diffraction.

No. 3. *Prof. W. Harkness*.—Theory of the Horizontal Photoheliograph, including its application to the determination of the Solar Parallax by means of Transits of *Venus*. *M. Erck*.—An improved mode of viewing the Sun.

The Royal Geographical Society,—Vol. 21, No. 1, 1877.

Stuart.—The Ascent of Mount Ararat in 1866.

The Royal Society,—Proceedings, Vol. 25, No. 176.

C. H. Gillingham.—On a new Form of the "Sprengel" Air-pump and Vacuum-tap.

F. Chambers.—The Diurnal Variations of the Wind and Barometric Pressure.

W. Huggins.—Note on the Photographic Spectra of Stars. *H. Tomlinson*.—On the Increase in Resistance to the Passage of an Electric Current produced on Wires by Stretching.

——. ———,—Philosophical Transactions, Vol. 165, Pt. II; Vol. 166, Pt. 1.

Vol. 165, Pt. II. *F. Chambers*.—On the Mathematical Expression of Observations of Complex Periodical Phenomena; and on Planetary Influence on the Earth's Magnetism. *Dr. Ferrier*.—Experiments on the Brain of Monkeys. •*W. Crooke*.—On Repulsion resulting from Radiation. *Dr. Allman*.—On the Structure and Development of *Myriothela*. *J. N. Lockyer*.—Spectroscopic Observations of the Sun. *J. Prestwich*.—Tables and Temperatures of the Sea at different depths beneath the surface, reduced and collated from the various observations made between the years 1749 and 1868 discussed.

Vol. 166, Pt. 1. *W. C. Williamson*.—On the organization of the Fossil Plants of the Coal Measures, *Myelopteris*, *Psaronius* and *Kaloxylon*. *J. Tyndall*.—The

Optical Department of the Atmosphere in relation to the Phenomena of Putrefaction and Infection. *C. Chambers*.—The Absolute Direction and Intensity of the Earth's Magnetic Force at Bombay and its Secular and Annual Variations. *H. N. Moseley*.—On the Structure and Relations of the Alcyonarian *Heliopora cœrulea*, with some account of the Anatomy of a species of *Sarcophyton*: Notes on the Structure of Species of the Genera *Millepora*, *Pocillopora*, and *Stylaster*, and Remarks on the Affinities of certain Palæozoic Corals. *R. von Willemoes Suhm*.—On the Development of *Lepas fascicularis* and the "*Archisoëa*," of Cirripedia. *Prof. O. Reynolds*.—On Rolling-Friction. *F. M. Balfour*.—On the Development of the Spinal Nerves in Elasmobranch Fishes. *Prof. Owen*.—On the Fossil Mammals of Australia. *C. S. Tomes*.—On the Development of the Teeth of Fishes, *Elasmobranchii* and *Teleostei*. *G. J. Romanes*.—The Croonian Lecture. Preliminary Observations on the Locomotor System of Medusæ. *O. Reynolds*.—On the Refraction of Sound by the Atmosphere.

London. The Zoological Society,—Transactions, Vol. 9, Pt. 10.

A. G. Butler.—Revision of the Heterocerous Lepidoptera of the family *Sphingidae*.

Melbourne. The Royal Society of Victoria,—Transactions and Proceedings, Vol. 12, 1876.

R. L. J. Ellery.—On the forthcoming Transit of Venus. *R. Etheridge*.—Observations on Sand-dunes of the Coast of Victoria. *R. L. J. Ellery*.—On the Photographic processes to be adopted in Observing the Transit of Venus. Notes on some of the Physical Appearances observed in the late Transit of Venus. *G. Foord*.—On some of the Results of the "Challenger" Expedition.

Moscow. La Société Impériale des Naturalistes de Moscou,—Bulletin, No. 2, 1876.

A. Petrowsky.—Noto sur le Gen-Seng ou Gen-Chen.

———. ———.—Nouveaux Mémoires, Tome 13, Livraison 5.

Trautschold, H.—Die Kalkbruch von Mjatschkowa.

Palermo. Società degli Spettroscopisti Italiani,—Memorie, Dispensa 1. Gennaro, 1877.

H. Draper.—Photographs of the Spectra of Venus and ∞ Lyrae. Astronomical Observations on the Atmosphere of the Rocky Mountains made at elevations of from 4,500 to 11,000 feet, in Utah and Wyoming Territories and Colorado.

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PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR MAY, 1877.

The Monthly General Meeting of the Asiatic Society was held on Wednesday, the 2nd inst., at 9 o'clock P. M.

W. T. BLANFORD, Esq., Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the editor, C. Morehead, "Memorials of the Life and Writings of the Rev. R. Morehead, D. D."
2. From the author, "The Materia Medica of the Hindus," compiled from Sanskrit Medical Works, by Uday Chand Dutt.
3. From the author, "Serpent and Siva Worship and Mythology in Central America, Africa, and Asia," by Hyde Clarke.
4. From the authoress, "The Mountain Karen Colony in Toungoo, Burma," by Mrs. E. Mason.
5. From Bábu Haris Chandra of Banáras, through Dr. Rájendralála Mitra, a Tibetan drawing of Buddha and his disciples.

The following gentlemen, duly proposed and seconded at the last Meeting, were elected Ordinary Members—

Mr. J. A. Bourdillon.

Mr. W. Sandford.

The Hon'ble T. E. Ravenshaw, C. S.

The following are candidates for ballot at the next Meeting—

1. H. K. W. Arnold, Esq., proposed by Major H. H. Godwin-Austen, seconded by J. Talboys Wheeler, Esq.

2. The Mahárájá of Darbhangá, proposed by H. B. Medlicott, Esq., seconded by Capt. J. Waterhouse.

A. W. Croft, Esq., for re-election, proposed by H. F. Blanford, Esq., seconded by W. T. Blanford, Esq.

The CHAIRMAN announced that, in accordance with the notice given at the March Meeting, the votes would be taken whether the following rider to Rule 64 should be added to the Rules of the Society.

Before circulating any question coming under clause (c) of Rule 64 for the votes of the general body of members of the Society, the Council shall cause to be sent to every resident member, at least 48 hours before the General Meeting at which such question is to be proposed, a printed circular in which shall be set forth the nature of the proposal and the reasons for it, in order that it may be duly discussed at such General Meeting. A statement of any objections that may be raised at the Meeting against the proposal shall also be circulated with the voting papers.*

Mr. Waldie and Major Godwin-Austen were appointed Scrutineers and reported that there were 62 votes for the addition and 2 against it. The CHAIRMAN thereupon announced that the proposed Rule had been carried.

The CHAIRMAN announced that Col. J. F. Tennant had been appointed a Member of Council in the place of Dr. D. B. Smith.

The SECRETARY read extracts from a letter from Dr. Dobson stating that Mr. Geflowksi was about to commence work upon the bust of Dr. Oldham, and that the marble bust of Dr. Stoliczka by the same sculptor was also in progress and nearly finished.

Mr. W. T. BLANFORD called attention to some recent researches by Prof. Jeitteles, of Vienna, on the origin of the domestic dog, researches which have a peculiar interest in India, because in Professor Jeitteles' opinion two common Indian animals are amongst the most important wild species from which the various forms of domestic dog are descended. Other authors have already concluded that several wild forms of wolves and jackals have been tamed by man in various parts of the world and that different races of dogs have thus originated, many of the races having of course undergone great modification through the process of artificial selection by man and from other causes. Most of the details known before 1868 were given by Darwin in his work on 'Domesticated Plants and Animals' and the conclusions at which he arrived, that domestic dogs are derived from several different wild species, appear to be confirmed by Prof. Jeitteles, although the researches of the latter have shewn that some forms formerly supposed to have contributed to the ancestry of domestic dogs must be omitted from amongst the races from which various kinds of dogs are derived and others previously unsuspected must be included.

Professor Jeitteles' first contribution to this very interesting question appears to have been the examination and comparison of dogs' skulls found with human remains of the stone age. An animal had already been de-

scribed by Rüttimeyer from the pile buildings (*Pfahlbauten*) or lake dwellings of Switzerland as the peat dog (*Torf-hund*) *Canis familiaris palustris* and considered a form intermediate between wolves and jackals. Professor Jeitteles considers that the skull of this dog is absolutely identical with that of the jackal, *Canis aureus*. He also shews that many of the modern smaller races of dogs are in all probability descended from the same ancestor. The Asiatic jackal, as is well known, becomes very rare east of the Bay of Bengal, and is unknown in Southern Burma, the Malay Peninsula, Siam or China, whilst to the westward it extends a considerable distance into Europe, being found in Turkey and Greece, and it ranges throughout northern Africa.

Professor Jeitteles remarks that in some of the smaller races of dog, especially terriers, owing to thorough domestication, and the combined effect of more highly developed intelligence and disuse of muscular power through many generations, the form of the jackal skull has been changed by the loss of the ridges to which the muscles are attached and the development of the brain cavity, so that the form recalls in a singular manner that of certain monkeys.

The next dog skulls to which Professor Jeitteles turned his attention were those of the dogs found associated with human remains of the bronze age at Olmütz and other localities. These are much larger than the dogs' skulls of the stone age, and differ in several peculiarities, especially in being much more wolf-like. Still they shew many differences from the skulls of the European wolf; they are smaller, and there are important distinctions in the dentition. After comparing the bronze age skulls with those of several wild species of African and American *Canidae*, they were at last found to agree with singular accuracy with the skull of the Indian wolf, *Canis pallipes*. The chief peculiarity of dentition in which the dog of the bronze age and the Indian wolf agree, whilst both differ from the common European wolf, is that in the two former the length of the carnassial tooth is less than that of the two hinder or tubercular molars in the upper jaw, whilst in the common wolf the reverse is the case.

Amongst living dogs, some shepherd's dogs appear most closely allied in the form of their skull to their probable ancestor of the bronze period. Poodles came nearest after the shepherd's dog.

Professor Jeitteles suggests that the Indian wolf is also found north of the Himalaya and Hindu Kush. In this view Mr. Blanford said he could not quite agree. The wolf of Central Asia is certainly a much larger form, the skins obtained by Dr. Stoliczka in Eastern Turkistan appeared to belong to the European wolf or a closely allied species, but unfortunately no skulls were brought. Dr. Severtzov also refers the wolf of western Turkistan to *Canis lupus*. The Persian wolf however is unknown;

but it is more probably allied to the European than to the Indian species, because the other mammals of the Persian highlands are Palearctic forms. Even the wolf of the Baluchistan highlands is, there is every reason to believe, a larger animal than *Canis pallipes*. There is a smaller wild Canine in Persia known as *Sag-gürg* (dog wolf) which, however, to judge by a flat skin, the only portion examined, is not the Indian wolf. A small slender form of wolf is stated by Professor Jeitteles on the authority of Professor Bagdanow of St. Petersburg to exist in the steppes between the Aral and Caspian.

One Asiatic wolf, however, that of the Tibetan highlands, *Canis laniger*, Hodgson, does appear to approach the Indian wolf to some extent. It appears to be somewhat larger, though inferior in size to the European wolf. The Indian Museum contains a fine series of skulls of the Tibetan wolf derived from the Society's old collection, and although these considerably exceed the skulls of *C. pallipes* in size, they shew the same peculiarity of the molar teeth, the "carnassial" being a little shorter than the two tubercular molars taken together. In five skulls of the Tibetan wolf the length of the former varies from 19 to 22 millimètres measured along its outside margin, that of the two latter together similarly measured from 21 to 23·5 mill. The length of the skulls from the anterior lower edge of the *foramen magnum* to the alveolar margin of the incisors measures in these five skulls (or rather in four, one being imperfect behind,) from 190 to 210 millimètres (7·46 to 8·25 inches).

Professor Jeitteles proceeds to trace the probable descent of the half-wild common street-dog of Egypt and the Levant from one of the African jackal-like animals *Canis lupaster*, Hemp. and Ehr. and of an African race of greyhounds from one of the forms of *C. anthus*, Cuv. With these we have no particular concern, but it is otherwise as regards the pariah dog of India. Professor Jeitteles is inclined to believe from the accounts given by various naturalists and travellers that there are two races of pariah; a larger, probably derived from *Canis pallipes*, and a smaller from *C. aureus*. Despite Jerdon's mention of the jackal-like dogs seen occasionally about Indian villages, it may be doubted whether any race of Indian pariah closely resembles the jackal, all appear to be much larger, and have rather the build of a wolf than a jackal. Mr. Blanford added that he was also unable to recognise two distinct races of pariah dogs, a small one and a large one; numerous variations in size occur of course, but he could not say that he had ever seen two well marked kinds. Larger dogs are kept by particular classes of natives for hunting purposes, and the common dogs appear always to run larger in those parts of India in which they are useful and can protect the flocks against the smaller carnivora, such as wolves and jackals, whilst they are small and starved from ill feeding in other parts of

the country where no care is taken of them. The subject, however, requires very much more attention than has been paid to it. One point to be remembered is that in many parts of India, around large European stations, there has been so great an admixture of the blood of European races, that a pure-bred pariah is a rarity.

It has long been known that we are probably indebted to the early inhabitants of India for two domestic animals, the buffalo and the peacock; the origin of the humped cattle is obscure, and the common fowl appears to be descendant of the Burmese and not of the Indian race. If Professor Jeitteles be correct in his views it appears highly probable that India will also claim the ancestry of some of our most valuable races of dogs. The chief reason for calling the attention of the Society to the subject is in order to suggest a further study of the pariah dogs of India. A good collection of skulls may aid considerably in working out the question of the dog's ancestry, and much light may be thrown upon the subject of the derivation of the races of men who inhabited Europe in the bronze age by determining the source whence they procured their domestic animals.

Mr. Blochmann exhibited some Arabic and Persian Inscriptions from Hānsī, received from Mr. J. G. Delmerick, Dihlī.

Hānsī.

Abul-Fazl, in his *A'in-i-Akbarī*, and Amín Rāzī, in his *Haft-Iklīm*, speak of Hānsī as a place famous in ancient times. It is first mentioned in 427 H., or A. D. 1035-36, when Mahmūd of Ghaznī took the fort of Hānsī, which up to that time had been known as the 'Virgin.' A short description of the conquest is given in the *Tārīkh-i-Baihaqī*; vide Dowson, Elliot's History of India, II, 140.

From a Prithwī Rājā inscription of Samvat 1224, or A. D. 1167, published in the As. Researches, Vol. XV, and in the Transactions of the R. As. Socy. (Vol. I, pp. 133, 461), it would appear that Hānsī was also called Āsī, and that Prithwī Rājā had a palace there. Vide also Cunningham, Arch. Reports, Vol. V, p. 142.

Hānsī is frequently mentioned in the fights preceding the final capture of Dihlī in 589 H. (A. D. 1193). The oldest inscription found by Mr. Delmerick belongs to 593 H., or A. D. 1197; vide below Inscr. I.

In the end of the reign of Iltitish (about A. D. 1236), Malīk Saif-ud-dīn is mentioned as *zābit* (ظابط), or governor, of Hānsī (*Baddoni* I, 70).

From the inscriptions given below it appears that 'Alā-uddīn Khiljī, in 1303 A. D., repaired the fortifications of Hānsī.

Under Kṛṣṇ-uddīn Mubārak Shāh I. (1316 to 1320), we hear of a Malīk Nizām-uddīn Shukrī Hānsīwāl. He built the Shukrī mosque at Hānsī, which was called 'Shukrī' ('thanksgiving'), because the five daily prayers

were read in it, and also prayers for the soul of the builder. *Ziyā-i-Barānī*, p. 380.

Hānsī is occasionally mentioned by the historians of the reign of Fīrūz Shāh III. (1351 to 1383, A. D.). Not long after his accession, Fīrūz Shāh, on a visit to Hānsī, was taken to task by the renowned Shaikh Ḳuṭb-uddīn of Hānsī, and was warned to give up wine drinking and hunting. Ḳuṭb's successor, Nūr-uddīn, refused the king's request to emigrate to Hisār Fīrūzah.* Fīrūz Shāh had some reason to treat the Hānsī Shaikhs with consideration. Badāonī (I, p. 242) relates that Fīrūz Shāh, when only a Malik, received from Shaikh Naṣir-uddīn, the 'lamp of Dihlī', the promise of the throne of Dihlī. When Muhammad Shāh ibn Tughluḳ, the reigning king, heard of it, he gave orders to bring Malik Fīrūz and Shaikh Naṣir as prisoners to him in Sindh. When they passed Hānsī, Shaikh Badr-uddīn (a descendant of Shaikh Jamāl) exclaimed, 'Here they take a prisoner to his throne, and he knows it not.' On reaching Tattah in Sindh, the escort reported to Muhammad Shāh the arrival of the prisoners, and they were ordered to kill them at once. But as the king during the interview was drunk and his son had gone on a hunting expedition, the escort set Malik Fīrūz at liberty, who immediately, with the consent of the nobles, raised the standard of revolt, and had Muhammad Shāh's son killed. When Fīrūz Shāh returned as king from Sindh to Dihlī, he gave Shaikh Badr-uddīn Parganah Chaurāsī as a present.

Hānsī escaped the fury of Timur: the prayers of the saints protected the town, as well as Hisār Fīrūzah.

In 814 (A. D. 1411) we find that the district (*khittah*) of Hānsī was held by Maliks Idrīs and Mubārīz Khān his brother; and some time after, during the reign of Mubārak Shāh II., Hānsī was taken from Malik Rajab Nādir and was given to the Malik-ushshark, the king's nephew.

Ibrāhīm Lodī (1517 to 1525, A. D.) used the fort of Hānsī as a State prison. Hamīd Khān was governor during his reign. Hamīd Khān, who is mentioned below in Inscr. VI, was defeated by Prince Humáyūn in 1526. This victory was Humáyūn's first exploit; hence Bábar gave him Hānsī and Hisār Fīrūzah as *jágir*.

During the reign of Akbar, who on a visit to Hānsī in 986 H. (1578 A. D.) offered up prayers at the shrine of Shaikh Jamāl, Mahall Hānsī belonged to Sirkār Hisār Fīrūzah. It contained, according to the *Áin* 836115 bighahs, and was assessed at 5434438 dāms, or 135861 Akbarshāhī Rupees, inclusive of 130056 dāms (or 3251½ Rupees) *madad-o-ma'āsh* land. Abul Fazl mentions Rājputās, Multānīs, Játūs, and Jats, as the principal tribes of the district and believed the *mahall* capable, or liable, to raise a force of 500 horse and 7000 foot.

Elliot in his Glossary (Beames, Races of the N. W. Provinces, I, pp.

* This Nūr-uddīn of Hānsī was the preceptor of Shams-uddīn 'Aff, the historian.

88, 256), mentions the Dogars as a tribal element in Hānsī, and refers to the worship of Gogā Pīr, a local saint, who is invoked in the district between Hānsī and the Ghārā. *Vide* also Atkinson, *Gazetteer*, N. W. Provinces, Vol. III, p. 516.

It is curious that Hānsī is not mentioned by the historians of the reigns of Jahāngīr, Shāh Jahān, and Aurangzīb. Nor do the inscriptions given below belong to this period of Indian history.

The *Tazkirah-i-Salāṭin-i-Chaghtāi* mentions several times one Nāhir Khān, a Shaikhzādah of Hānsī (1122 H., or A. D. 1710), who was Faujdār of Dholkāh in Gujarāt and Diwān of Ahmadābād. During the reign of Muhammad Shāh, Shahdād Khān Khweshagī was appointed Faujdār of Hānsī and Hisār, "which district from old times had been a bed of rebellion, and which, in consequence of the weakness of the government, had for some time paid nothing into the imperial treasury." Shahdād reduced the forts of the districts, and kept the rebels down. He chiefly employed men of his own clan.

The *Imād-ussa'adat* (Lucknow edit., p. 125) mentions that Muhammad Bashīr Khān received from Nawāb Najaf Khān Bahādur the district of Hānsī and Hisār.

In the end of last century, Hānsī became for a short time (1798 to 1801) the capital of George Thomas, of Tipperary, whose short-lived kingdom comprised Hānsī, Hisār, Mahim, Bhadrā, Sīdhmukh, Sīwānī, Behal, Jamālpūr, Toshām, Agrowah, Barwālā, and Jīnd, which, with several places he held of the Marāṭhas, yielded a revenue of 430,000 Rupees, the former revenue derived from the same places having been Rupees 2,010,000 (*vide* Franklin, *Memoirs of George Thomas*, p. 92). When Thomas chose Hānsī as his capital, the walls of the city had fallen into decay; and 'as the town had long been deserted', he had great difficulty in procuring inhabitants. By gentle treatment he collected about six thousand people. In the end of 1801, he was attacked by the Marāṭhas under Perron and had to surrender. In the middle of January, 1802, he was escorted to the British frontier. He intended to proceed towards Calcutta, in order to retire from public life. But death overtook him, on the 22nd August, 1802, at Berhāmpūr in Bengal, where he lies buried.

Of Hānsī celebrities I have to mention the following—

1. Shaikh Jamāl. He belongs to the great saints of India. He was a descendant of the renowned Abū Hanīfah of Kūfah. Shaikh Farīd-uddīn Ganj-i-Shakar of Ajodhan (Dīpālpūr) was his friend and lived with him for twelve years at Hānsī. From his oratorical powers, he was called 'Khaṭīb', the preacher, or Kutb-i-Khuttāb, 'the pole star of preachers.' One of his treatises has the title of 'Mulhamāt.' He died in 659 H., or A. D. 1261, and lies buried at Hānsī.

2. **Maulānā Mughīṣ** (مغیث). He was a poet and flourished during the reign of Jalāl-uddīn Fīrūz Shāh II. (1290 to 1296, A. D.) Badāonī and the *Haft Iklim* quote a few of his verses.*

* Those who delight in the subtleties of Persian Prosody will find the verse ascribed by Badāonī to Mughīṣ (*Bad.* I, 181) of interest. Badāonī says that Mughīṣ composed a whole *ghaza* that could be read in *nineteen* different metres! It is a pity that the MSS. which the editor of the *Bibl. Indica* edition had for collation, give a corrupt reading of the second hemistich. The first hemistich is—

دو در گوش و قد خوش دو خد خوب و خط تر
12 11 10 9 8 7 6 5 4 3 2 1

The twelve words of this hemistich are all monosyllabic, and the 2nd, 5th, 8th, and 11th words have the *Izāfat*. But the *Izāfats* of the 5th and 11th words are not necessary, as *ast* may be supplied. Again the 2nd, 5th, 8th, 11th words may in Persian be read with or without the *Tashdīd*. Bearing this in mind, we get the following *nineteen* metres. (The numbers in brackets refer to the paragraphs in my 'Prosody of the Persians'.)

I. *Hazaj*.

1. مفاعیلن 4 times (14). 2. مفاعیلن 4 times (16).

II. *Rajaz*.

3. مستفعلن 4 times (33). 5. مفتعلن مفاعیلن 2 times (36).
4. مفتعلن 4 times (35). 6. مفاعیلن مفتعلن 2 times (37).
7. مفتعلن مفتعلن مفاعیلن مفتعلن (p. 37. l. 1.).

III. *Ramāl*.

8. فاعلاتن 4 times (41). 9. فاعلاتن 4 times (43).
10. فاعلاتن فاعلاتن 2 times (46).
11. فاعلاتن فاعلاتن فاعلاتن فاعلاتن (orig. form of 41).

IV. *Muzāra'*.

12. مفاعیلن فاعلاتن 2 times, (orig. form of 67).

V. *Mujtaṣṣ*.

13. مستفعلن فاعلاتن 2 times (76). 14. مفاعیلن فاعلاتن 2 times (76).

VI. *Khafif*.

15. فاعلاتن مفاعیلن فاعلاتن مفاعیلن (a *muṣamman Khafif*, p. 59 note).

In the above fifteen metres, the four *Izāfats* of the verse must all be read; but as two may be left out, we get—

VII. 'Arz.

16. مفاعیلن فعولن 2 times (106).

VIII. 'Amiq.

17. فاعلن فاعلاتن 2 times (106).

Mujtaṣṣ Akhrab.

18. مفعول فاعلاتن 2 times (67).

And if only the last of the four *Izāfats* be left out, we have—

Rajaz.

19. مفتعلن مفتعلن مفاعیلن مفعولن (p. 38, 2nd line).

3. Shaikh Ḳuṭb-uddīn Munawwar, son of Burhān-uddīn, son of Shaikh Jamāl. He is as renowned a saint as his grandfather. He had been a disciple of Nizām-uddīn Auliya (the Dihlī saint), lived a retired life, and took no presents from kings. Muhammad Shāh Tughluḳ went personally to Hānsī, in order to induce him to come with him to Dihlī. The meeting took place at Bhainī (بهینی), near Hānsī, and is minutely related in the works on Indian Saints. Shaikh Ḳuṭb died in 760 H., (A. D. 1359), and lies buried at Hānsī.

4. Ghulām 'Alī Bhikan. He lived during the reign of Aurangzib, and compiled in 1113 H. (A. D. 1701) a Persian dictionary, entitled *Ashhar-ullughāt*.

5. 'Abdul-Wāsi'. His Persian grammar, entitled *Risālah-i-'Abdul-Wāsi* is read in every Madrasah in India. He also wrote in Persian an Urdū Dictionary of Technical (chiefly Agricultural*) Terms, which he entitled *Gharāib-ullughāt*. This book, copies of which are very rare, was criticized by Sirāj-uddīn 'Alī Khān Arzū in his *Nawādir-ul-Alfāz*, likewise a rare Urdū Dictionary of Technical Terms. Sir H. Elliot used the latter work extensively for his 'Supplemental Glossary.'

I now proceed to give my readings and translations of Mr. Delmerick's rubbings.

I.

From the Mīr Mīrān Sālārī Mosque, inside the fort of Hānsī. One line, 4 ft. 11 in. by 7 in. The characters are rude, but clear.

امربنا مسجد العبد علی بن اسفندیار فی عشر ذی الحجة سنة ثلث وتسعين
و خمس مایه ۱۱

The slave [of God] 'Alī, son of Isfandiyār, ordered the building of this mosque on the 10th Zil-Hajjah, 593. [23rd October, 1197.]

If the last be looked upon as awkward, we may double the 'Arz, and thus get
مفاعیلن مفاعیلن 2 times.

If we had the whole ghazal, it is possible that we should have to modify one or two of the above 19 metres; but as it is, they suit the first hemistich.

The author of the *Haft Iklim* says that he knows nothing about Mughis, but he had often seen verses by him. He quotes the following (metre *Munsarīh*, مفاعیلن فاعیلن)—

چاک کند با بسے جیب به بستان حسن * چون تو گلیه گر کشد سرز گریبان حسن
ماید لطف غیب شد چو بگیتی فراز * جای نمکدان نشست روی تو برخوان حسن
مملکت دلبری حجت اول نداشت * داد نگینش نون لعل تو از کان حسن

I have found in no other Tazkirah notices of this poet.

* Hānsī appears to have once been held in high estimation for its agricultural progress. Even at present Hānsī cows are proverbial for their excellence.

This is the oldest Muhammadan inscription this side of Dihli, that I have seen.

II.

From the Bū 'Alī Bakhsh Walī Mosque in the Mughalpārah Quarter of Hānsī. Two lines, 2 ft. 6 in. by 7 in. The characters are rude.

هذا عمارۃ المسجد العبد الضعیف احمد بن محمد اسمندی فی المنتصف ربیع الآخر
سنه ثلث والعشرين وستمائة ۱۱

This mosque was built by the weak slave Ahmad, son of Muhammad, of Asmand, in the middle of Rab' II, 623. [Middle of April, 1226.]

Asmand is a small place near Samarqand.

III.

Inscription from the Barsī (برسی) Gate in Hānsī, to the left of the entrance. Barsī is the name of a place S. of Hānsī. Three lines; 9 ft. 3 in. by 1 ft. 4 in. The same heavy characters as found on other inscriptions of 'Alā-uddīn's reign. *Vide* Inscr. VI.

بعهد مملکت بادشاہ روی زمین * خدایگان سلاطین عالم دنیا و دین
ابو المظفر شاہ جهان محمد شاہ * کے باد مملکتش جوادان بروی زمین
یگانہ خسرو گیہان سکندر ثانی * رسیدہ صیت معالیہ ش تا بعلمین
بنانہادہ شد این بے نظیر دروازہ * کز ارتفاع بکیوان ہمی کند تمکین
بسمت حضرت دہلی کے ہست دارالملک * * * * *
بسال ہفصد و سہ آمدہ عمارت این

1. In the time of the reign of the king of the face of the earth, the lord of princes, 'Alā-uddunyā-waddīn,

2. Abul Muzaffar, the king of the world, Muhammad Shāh—may his kingdom be everlasting on the face of the earth!—

3. The unrivalled, the master of the world, the second Alexander, the fame of whose great deeds has reached the highest heaven,

4. This gate which has no equal was erected and is from its height an honor to Saturn [the keeper of the seventh heaven],

5. On the road to Dihli, the king's residence, which is the capital of the kingdom, * * * * * this strong fort [of Hānsī]

6. * * * * * in the year 703 the edifice was erected. [A. D. 1303-4.]

No doubt, 'Alā-uddīn fortified Hānsī as an outpost against the Mughuls.

IV.

From the Dīnī Mosque in the town of Hānsī, near the Sarāogyān Mandir. Three lines, 2 ft. 9 in. by 1 ft. 4 in.

بتوفیق خدای عالم و برکت مصطفی علیہ السلام درعہد بیمن و دولت ہمایون
خدایگان عالمشاہ بادشاہ اسلام راہی الانام فیروز شاہ السلطان خلد اللہ ملکہ و سلطانہ

بندو درگاه ساهن سلطاني بتاريخ غرة ذي القعدة سنة سبع وستين وسبعماية اين
مسجد بنا كرد ۱۱

By the grace of God the omniscient and the blessing of the chosen Prophot (upon whom be peace !), in the auspicious time and the august reign of the Lord, the king of the world, the king of Islām, the shepherd of the people, Fīrūz Shāh the king (may God perpetuate his kingdom and rule !), this mosque was erected by the slave of the throne Sāhān the Royal, on the 1st Zī Kā'dah, 767. [10th July, 1366.]

V.

From the Kuṭb Sāhib's Mosque, near the Dargāh of the four Kuṭbs, or saints, outside Hānsī, about forty paces from the Hānsī road. Eight lines, 2 ft. 7 in. by 11 in. Rude and indistinct characters.

الله الملك

بتوفيق الله تعالى بنده درگاه سبحاني ابا بكر بام جواني كه يک از مريدان پير دستگير
سلطان المشايخ شيخ ابوالفتح قدس الله سره العزيز است در پايان قطب اقطاب عالم
شيخ جمال الحق والشرع والدين طاب ثراه و جعل الجنة مثواه و نور الله مرقد
در وقت جلوس سجاده بندگي سلطان المشايخ شيخ فريد مد الله عمره اين مسجد را
بنا کنانيد - هر که درين مسجد نماز بگذارد بدعاي * * * ياد کند * کاتب حروف رضي
قطب نايب قاضي هانسي محله * * * شحنة * * * الخامس والعشر من ماله رجب
رجب قدرة سنة ست و تسعين و ثمانماية سنکدراش امين بن * * * گوري ۱۱

God is the King !

By the grace of the great God, the slave of the throne of the Almighty, Abā Bakr Bāmjawānī, who is one of the disciples of the helping spiritual guide, the king of Shaikhs, Shaikh Abul-Fath (may God sanctify his dear secret !), had this mosque erected near the pole of the poles of the world, Shaikh Jamāl-uddīn (may the earth of his grave be perfumed, may God make paradise his mansion, and may God illuminate his resting-place !), at the time when the worshipful king of Shaikhs, Shaikh Farīd (may God lengthen his life !) succeeded as the spiritual ruler. He who reads a prayer in this mosque, should remember (the builder) with a pious wish.

The writer of these lines is Razā Kuṭb, the representative of the Qāzī of Hānsī in Mahallah * * * police inspector * * * on the 15th Rajab (may the honor of the month increase !) of the year 896. The engraver is Amīn, son of * * * Gorī. [24th May, 1491.]

On the top, to the left of the words 'God is the King', in small characters—

در عهد بادشاه زمان سکندر شاه بن بهلول شاه سلطان خلد الله ملکه و سلطانه ۱۱

In the time of the king of the age, Sikandar Shāh, son of Buhlūl Shāh, the king, may God perpetuate his kingdom and rule !

I do not know what 'Bāmjawānī' is. If the ā in the second syllable were not long, I would read 'Abā Bakr nām jawānē,' a young man named Abā Bakr.

VI.

The following inscription is from the Barsí gate, to the right of the entrance. *Vide* above Inscr. III. Five lines, 1 ft. 2 in. by 1 ft. 6 in. The letters are chipped in places.

بناء عمارت این دروازه متین با مرمت علوی حصن حصین علای که مؤرخست سنه
اثنی و سبعماية در عهد سلطان السلاطين ابوالمظفر ابراهيم شاه سلطان خلد الله ملكه
و سلطانہ در عمل مسند عالي حميد خان بانتخاب كامل و در شقداري خواجه محمد
و بفرمايش * * * * * في الخامس من شهر ذي القعدة سنه ثمان و عشرين
و تسعمائة كاتب خانزاده نصر مفتي هانوي ۱۱

The building of the edifice of this gate, together with the repairs of the upper strong fort built by 'Alá-uddín, which is dated 702 H., was * * in the reign of the king of kings Aḥul Muzaḥfur Ibráhím Sháh the king, may God perpetuate his kingdom and rule!—during the governorship of the Masnad-i-'alí Hamíd Khán, with perfect choice, and during the *shikḡ-dári* of Khwájah Muhammad, and by order of * * * on the 5th Zí Ḳa'dah, 928. The writer is Khánzádah Naḡr, Muftí of Hánsí. [26th September, 1522.]

The correct year of the erection of 'Alá-uddín's fortification is 703 H., as given in Inscr. III.

VII.

From a Mosque near the Mirán Sálári Mosque. The stone is white marble and the letters are black and inlaid. Mr. Delmerick sends the following reading—

سجدت لك شكرا و حمدا خادم الفقراء حسن رضا إحداث نمود ۱۰۹۷ هجري ۱۱

I prostrate myself before Thee in thanks and in praise. The servant of the poor Hasan Razá erected it. 1097 H. [1686, A. D.]

The following papers were read—

1. *Note on a Copper-plate Grant from the Cuttack Collectorate.*—By

BÁBU RANGALÁL BANERJEA.

(Abstract.)

The plates were found in the muniment room of the Cuttack Collectorate, but there is no record to show whence they came and to whom they belong. Probably they had been submitted as a document in support of a claim for some rent free land when the Province of Orissá was first settled at the beginning of this century, but were never after taken away, the object of the owner having been defeated owing to the absence of a person who could decypher the document. The inscription records the grant of a village named Chandra in the fiscal division of Maraḍa in the province of Dakhshine Kosála, which has been identified with the modern village of Chandrá in Maraḍa Hariharpur in the neighbourhood of Cuttack. The donor was

Yajáti the founder of the Kesarí dynasty, who expelled the Buddhists and re-established Hinduism in Orissa about the close of the 5th century. Hitherto he has been supposed to have been an independent sovereign; but in the patent under notice he owns allegiance to Bhava Gupta of Magadha, and hence it would seem that it was a Hindu king of Magadha who overthrew the Buddhist sovereignty of Orissa and held the province as a dependency through a vassal. In the Temple records of Puri, the Buddhists are represented as Yavanas.

A Photozincograph will accompany the paper, which will appear in No. II of this year's Journal.

2. *On the Route between Sohár and el-Bereymí in 'Omán, with a note on the Zañt, or gypsies, in Arabia.*—By COLONEL S. B. MILES, Maskat. *

(Abstract.)

Colonel Miles describes the route from Sohár on the Persian Gulf, north of Maskat, across the Jabal Akhdhar Range to el-Bereymí on the outskirts of the southern Arabian Desert. He refers to the antiquities of the coast, which before the spread of Islám was held by the Persians, and gives interesting notes on the places he passed, the customs of the people, the scenery and produce of the country, and the geology and fauna of the mountain tracts. A map accompanies the essay.

The paper concludes with a notice of the Zañt, or gypsies, of Arabia, whom Dr. Sprenger identifies with the Jats of India. They are at once distinguishable from the Arabs as a distinct race, and are numerous in Arabia. They are accomplished handicraftsmen, and are to the natives of the interior what the banians are in the seaport towns. They speak among themselves, as elsewhere, a gibberish of their own manufacture, the plan being to prefix to Arabic words the letter *m* and to suffix the syllable *eeek*; thus the Arabic *qamar*, 'moon', becomes *máimareek*.

The paper will be shortly published in No. 1, Pt. I, of the Journal for 1877.

Mr. BLOCHMANN said—Several of the Zañt words given by Colonel Miles are corruptions of Arabic words; but some have no Arabic sound. The word for 'father' *bweieekkee*, looks like the diminutive of *ab*, father, with the ending *kee*; other words as *fidámeh* (rice), *jarrárah* (knife) are Arabic, but have in classical Arabic only kindred meanings.

It would be of interest to have the Zañt numerals, provided they do not use, when speaking among themselves, the Arabic numerals.

Mr. W. T. BLANFORD said that Col. Miles's paper referred to a region of great interest, but of which very little was known. It was visited by Lieut. Wellsted, of the Indian Navy in 1835, and briefly described by him

in the Journal of the Royal Geographical Society for 1837, (Vol. VII. p. 102) and also in his "Travels in Arabia." Both Zoology and Geology require investigation. Mons. Aucher Eloy, a French botanical collector, visited the Muscat hills about 1837, and brought away specimens of a few animals, but his collections were small and imperfect. The hills look from Muscat as if they consisted partly of the dark limestone which forms the headland of Mussendom at the entrance to the Persian Gulf. Some fossils from this limestone were examined by Dr. Stoliczka and found to be Triassic.

LIBRARY.

The following additions have been made to the Library since the Meeting held in April last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS,

presented by the respective Societies or Editors.

Bombay. The Indian Antiquary,—Vol. VI, Pt. 66, 1877.

J. F. Fleet.—Sanskrit and Old Canarese Inscriptions. *C. Horne.*—Paper-making in the Himálayas. *W. F. Sinclair.*—Notes on the Cavo of Panchalesvara in Mouje Bhamburde, Táluká Haveli, Zillá Puná. *Rev. F. Kettel.*—Three Kongu Inscriptions.

Calcutta. Geological Survey of India,—Memoirs, Ser. II. 2.

Dr. O. Feistmantel.—Jurassic (Liassic) Flora of the Rajmahal group, in the Rajmahal Hills.

London. The Athenæum,—Nos. 2578, 2579, 2580—1877.

——. Nature,—Vol. 15, Nos. 386, 387, 388—1877.

Palermo. Società degli Spettroscopisti Italiani,—Memorie, Dispensa 2, Febbraro, 1877.

Paris. La Société de Géographie,—Bulletin, Fevrier, 1877.

L'Abbé Desgodins.—De Yerkalo à Tsé-Kou (avec carte dans le texte)

Washington. Smithsonian Contributions to Knowledge,—Vols. XX, XXI.

Vol. XX. *Dr. J. H. Coffin.*—The Winds of the Globe; or the Laws of Atmospheric Circulation over the Surface of the Earth.

Vol. XXI. *Dr. S. Alexander.*—Statement and Exposition of Certain Harmonies of the Solar System. *S. Newcomb.*—On the general Integrals of Planetary Motion. *J. G. Swan.*—The Haidah Indians of Queen Charlotte's Islands, British Columbia: with a brief Description of their Carvings, Tattoo Designs, &c. *C. A. Schott.*—Tables, Distribution, and Variations of the Atmospheric Temperature in the United States, and some Adjacent parts of America.

Yokohama. Deutsche Gesellschaft für Natur und Völkerkunde Ostasien's, —Mittheilungen, Heft. 9—11, 1876.

BOOKS AND PAMPHLETS

presented by the Authors.

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PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR JUNE, 1877.

The Monthly General Meeting of the Asiatic Society was held on Wednesday, the 6th April, at 9 P. M.

W. T. BLANFORD, Esq. F. R. S., Vice-President, in the chair.

The following presentations were announced:—

1. From Colonel S. B. Miles, Political Agent, Muscat, the Prithví Ráj Rasau of Chand, and another MS.

The CHAIRMAN drew attention to the valuable nature of Col. Miles' gift, and said that the Council proposed that the special thanks of the Society should be given to Col. Miles for it. The proposal was put to the vote and carried unanimously.

2. From Mr. W. Theobald, a copy of his "Catalogue of the Land and Fresh-water Shells of British India."

3. From the Trustees of the Indian Museum, a copy of a Monograph of the Asiatic Chiroptera and Catalogue of the species of Bats in the Collection of the Indian Museum, Calcutta, by Dr. G. E. Dobson.

4. From Capt. J. Waterhouse, a Map of Turkey in Europe and the Black Sea, "with the adjoining parts of Russia and Turkey in Asia.

5. From the Rev. C. H. A. Dall, "Scientific Results of the exploration of Alaska," Vol. I.

6. From Dr. Rájendralála Mitra, a copy of the Káyastha Kaustubha, by Rájnaráyan Mitra.

7. From Dr. A. F. Bradshaw, copies of the following works:

The Travels of Guru Tegh Bahádur and Guru Gobind Sing. By Sirdár Attar Sing.

Sakhee Book, or the Description of Guru Gobind Singh's Religion and Doctrines. By Sirdár Attar Sing.

The Rayhit Nama of Pralád Rái.

8. From the Secretary to the Government of Bombay, a copy of Inscriptions from the Kudá Caves taken by Mr. J. Burgess, Archaeological Surveyor and Reporter to the Government.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected Ordinary Members :—

Mr. H. K. W. Arnold, the Maharájá of Darbhāṅgā, Mr. A. W. Croft, (re-election).

The following is a candidate for ballot at the next meeting :—

Nawáb Asghar 'Alí Khán, Dilír Jang Bahádur, C. S. I., proposed by Dr. Rájendralála Mitra, seconded by Capt. J. Waterhouse.

The SECRETARY laid before the Meeting a communication from Mr. W. McGregor on the subject of Lightning Conductors, accompanied by a copy of the following circular and memorandum of the British Association Committee on Atmospheric Electricity and Lightning-Rods.

“The Committee charged with this investigation and report desires to have as much information as possible regarding accidents from lightning. But in order that information of this class may possess scientific value, it is essential that all statements communicated should be clearly and definitely expressed, that they should be carefully authenticated, and that the address, as well as the name, of the observer should be given, to allow any further inquiry to be instituted that may be found to be desirable in the circumstances. The Committee has consequently drawn up the following memorandum to define the nature of the information it seeks, and earnestly requests that any person who may chance to know of accidents from lightning, or who may be able to give practical assistance in this inquiry, in the sense and particulars suggested by the memorandum, will address such communications, as they may be in a position to make on these subjects, to the Chairman of the Permanent Committee on Atmospheric Electricity and Lightning-rods. Meteorological Society, 30, Great George Street, Westminster, London.”

*Memorandum of information required in any case of Accident
from Lightning.*

1. The day, hour, and place of the occurrence.
2. The exact nature of the occurrence, especially specifying any unusual appearance or sound that has attended the discharge of lightning.
3. A minute and precise description of any damage that may have been produced by the discharge.
4. Record of any visible traces of electrical action that may have been left in the track of the discharge.
5. (The names and addresses of any person who may have witnessed

the actual discharge producing damage, or who may have suffered in any way from its effects.

6. The existence or non-existence of a lightning-rod in any form in the immediate neighbourhood of the accidents, and an exact description of the rod when any such appendage has been ascertained to be near, especially as to—

- (a) the nature of the metal of which the rod is composed :
- (b) the size of the rod :
- (c) the character of the conductor, whether it has the form of a solid cylinder, of a tube, of a flat strip, of a chain, or of a wire-rope :
- (d) the actual continuity of the conductor from end to end :
- (e) the character of the termination above, and the distance to which it extends there beyond any building or solid structure :
- (f) the character of the termination below, whether in dry or moist ground, how it runs into the ground, and how the earth-contact is ultimately made :
- (g) the manner in which the conductor is connected with any building, and especially whether there are any masses of metal in the building near, and whether such masses are or are not placed in metallic communication with the conductor.

7. Allusion to the fact whether the injurious discharge did or did not form part of an ordinary thunder-storm in progress at the time.

8. In case of the occurrence of a thunder-storm in progress at the time of the discharge, a description of the character of the storm as to intensity, duration, fall of rain, and apparent movement over the locality.

9. Any subsidiary or incidental observations that may have been made and that may seem to bear practically upon the physical conditions and circumstances of the phenomenon.

Messrs. H. F. Blanford and Eliot have expressed their readiness to investigate, when practicable, cases of accidents from lightning occurring in Calcutta, and information on cases occurring there or in other parts of India may be sent to them at the Meteorological Office, Calcutta, or to Mr. W. McGregor, River View, Dhubri, Assam.

The CHAIRMAN announced that Mr. J. C. Douglas had been appointed a Member of the Physical Science Committee, Mr. H. B. Medlicott of the Library Committee, and Mr. W. T. Blanford of the Finance Committee.

Also that on the recommendation of the Library Committee, the Council had passed an order that not more than two MSS. should be lent out at a time to the same person, except with the sanction of the Council.

Also that on the recommendation of the Natural History Committee, the Council had sanctioned the publication of Mr. Moore's Descriptions of the

134 R. S. Brough—*Maximum Magnetic Effect of Electromagnets*. [JUNE, new Species of *Lepidoptera* found in the late Mr. Atkinson's Collection, as a separate work in quarto form, to be brought out in fasciculi as funds permit.]

Also that on the recommendation of the Library Committee, the Council had sanctioned the appointment of a special assistant under Mr. Blochmann for the preparation of the Library Catalogue.

The following papers were read :—

1. *On the Diameter of the Wire to be employed in winding an Electromagnet in order to produce the Maximum Magnetic Effect*. By R. S. BROUGH.

In 1866 Mr. Schwendler investigated the best galvanometer resistance to employ in testing with Wheatstone's Bridge, a question which was previously involved in complete obscurity, some physicists arguing that since near balance the current passing through the galvanometer approaches the indefinitely small, therefore the number of convolutions, and hence the resistance, of the galvanometer ought to be indefinitely great.*

I may here remark that Count du Moncel in a communication to the Academy of Sciences has unjustly criticized Mr. Schwendler's method of treating the subject of electromagnets.† The latter supposed the dimensions of the bobbins (as I, also, do in this paper) to be given, fixed, and immutable; while the learned Count starts with varying the depth of the bobbin, and piques himself on getting a larger magnetic effect out of it than Mr. Schwendler did. The best thickness of wire to wind on a given bobbin, and the best size and shape of bobbin to employ for a given purpose, are two totally distinct questions.

While investigating the above problem, the question of the influence of the insulating covering of the wire on the results occurred to Mr. Schwendler, and he went into it in a subsequent paper.‡

Mr. Schwendler attacked the problem from the point of view of the resistance of the bobbin; but it seems to me that it yields more readily, and presents a more definite result (the former method gives an equation of the 4th order, which has to be solved by a rather coarse approximation) when we start from the thickness of the wire. This method has also led me to a singularly simple relation existing between the resistance of the electromagnet and the external resistance.

I shall take the case of an elongated bobbin with straight sides and circular ends, because this is a very common form to give to galvanometer coils, and because the results can at once be reduced to those applicable to

* Philosophical Magazine, May, 1866.

† Comptes Rendus, Vol. LXXVI, pp. 368-371.

‡ Philosophical Magazine, January 1867.

circular bobbins by simply putting the length of the sides equal to nothing in the various expressions.

Let Y = the magnetic effect of the bobbin

R = „ resistance „ „

S = „ external resistance.

E = e. m. f. of the battery.

and n = the number of convolutions.

Then (Jacobi and Dub)

$$Y = \frac{n E}{R + S}$$

and the problem is to make Y a maximum,* treating the diameter of the wire with which the bobbin is wound as the independent variable, of which n and R are known functions.

Let A = the outer diameter of the circular ends

a = „ inner „

b = „ length of the bobbin

c = „ „ „ straight sides between the circular ends

δ = „ diameter of the wire

ρ = „ radial thickness of the insulating covering

and L = the length of the wire on the bobbin

$$\text{Then, } n = \frac{b (A - a)}{2 (\delta + 2\rho)^2}$$

for each wire being allowed a square, the length of whose sides is equal to the diameter of the covered wire: and

$$L = \frac{b (A - a)}{2 (\delta + 2\rho)^2} \left\{ \frac{\pi (A + a)}{2} + 2c \right\}$$

But

$$R = \lambda \frac{4 L}{\pi \delta^2}$$

where λ is the specific resistance of the conducting material of the wire, i. e. the resistance between opposite faces of the unit cube of the conducting material.

Therefore

$$R = \frac{\lambda b (A - a)}{\pi \delta^2 (\delta + 2\rho)^2} \left\{ \pi (A + a) + 4c \right\}$$

We had

$$Y = \frac{n E}{R + S}$$

* The force exerted by a coil on a steel magnet is proportional to Y , whereas the force exerted on a soft iron armature is proportional to Y^2 , but whatever value of the variable makes Y a maximum, will also make Y^2 a maximum, so the one solution meets both cases.

$$\text{Put} \quad \theta = \frac{1}{Y}$$

$$\text{Then} \quad \theta = \left(\frac{R}{n} + \frac{S}{n} \right) \frac{1}{E}$$

and it is required to make θ a minimum with respect to δ .

$$\text{Now} \quad \theta = \left(\frac{\lambda}{\pi \delta^2} \left\{ \pi (A + a) + 4c \right\} + \frac{(\delta + 2\rho)^2 S}{b (A - a)} \right) \frac{2}{E}$$

$$\frac{d\theta}{d\delta} = \left(-\frac{\lambda}{\pi \delta^3} \left\{ \pi (A + a) + 4c \right\} + \frac{(\delta + 2\rho)^2 S}{b (A - a)} \right) \frac{4}{E}$$

$$\text{and} \quad \frac{d^2\theta}{d\delta^2} = \left(\frac{3\lambda}{\pi \delta^4} \left\{ \pi (A + a) + 4c \right\} + \frac{S}{b (A - a)} \right) \frac{4}{E}$$

$$\text{Putting} \quad \frac{d\theta}{d\delta} = 0, \text{ we have}$$

$$\delta^2 (\delta + 2\rho) = \frac{\lambda b (A - a)}{\pi S} \left\{ \pi (A + a) + 4c \right\}$$

which equation expresses implicitly the value of δ which makes the magnetic effect a maximum.

$$\text{Let us put } \frac{\rho}{\delta} = \mu, \text{ then}$$

$$\delta = \sqrt[4]{\frac{\lambda b (A - a)}{\pi (1 + 2\mu) S} \left\{ \pi (A + a) + 4c \right\}}$$

This expression for δ contains μ , itself a function of δ ; but a very simple artifice suffices to get over this difficulty. First suppose $\mu = 0$, and solve the equation: the result will be an approximate value of δ , namely, that which it would have, were there no insulating covering to the wire.

Then employing this approximate value of δ , calculate $\mu = \frac{\rho}{\delta}$; and recalculate the value of δ , using this value of μ .

By repeating this process, which involves very little trouble if logarithms be employed, any desired degree of accuracy may be attained.

From the above expression for δ we see that, so long as $\mu \neq 0$, the diameter of the wire (without its covering) will always be *less* than it would be were there no insulating covering.

The expression for the resistance of the bobbin may be written

$$R = \frac{\lambda b (A - a)}{\pi \delta^2 (1 + 2\mu)^2} \left\{ \pi (A + a) + 4c \right\}$$

and supplying its value for δ , we find

$$R = \frac{1}{1 + 2\mu} S$$

from which it is seen that, so long as $\mu \neq 0$, the resistance of the bobbin

must always be *less* than the external resistance. Putting $\frac{\rho}{\delta}$ for μ , we have

$$R = \frac{\delta}{\delta + 2\rho} C$$

which expresses the physical law, namely, that

$$\frac{\text{Resistance of bobbin}}{\text{External resistance}} = \frac{\text{Diameter of bare wire}}{\text{Diameter of covered wire}}$$

2. *Remarks on Mr. Campbell's Paper on Himalayan Glaciation in the Journal of the Asiatic Society of Bengal, Pt. II, No. 1, 1877.* By W. THEOBALD, *Geological Survey of India. Communicated by MR. H. F. BLANFORD.*

As Mr. Medlicott in his note to Mr. Campbell's paper has termed it a refutation of my views on the ancient moraines of the Kangra district, I would beg to say a few words in arrest of judgment on this point and to show wherein Mr. Campbell has not only failed to controvert my position but even to grasp its cardinal features.

I do not propose to introduce any new matter in support of my own views but to confine myself to Mr. Campbell's criticism and the more clear explanation of my own position, which I regard as not materially weakened by anything my critic has adduced.

Mr. Medlicott, it is true, does not go the length that I do as regards the extension of glaciers formerly into the Kangra valley, and it is superfluous to admit the weight which such an opinion should carry, but the difference between us is one more of degree than anything else, and if I am not mistaken, Mr. Medlicott differs in an opposite direction no less from Mr. Campbell than from myself.

On the other hand, Mr. H. F. Blanford in the discussion on Mr. Campbell's paper spoke of glacial action so low as 4500 feet, which goes far to bridge over the gulf which separates my estimate of the former limits of glaciers in Kangra from the more restricted estimate currently held on the subject.

As for whether or no these glaciers protruded into the lower grounds ten miles or so, either beyond or within the general limits assigned to them by me, is, in view of their stupendous development, a matter of little importance, and neither under present conditions, either easy to settle or worth contending for, the main question being, did glaciers, during later tertiary times or more recently, descend in Northern India to so low a level as 2000 feet above the sea?

Much that I have seen since fully corroborates this view, and it only remains to glance at the arguments which Mr. Campbell has adduced against it.

Mr. Campbell evidently relies much on the weight which should attach to his extended experience and special study of glacial phenomena, but his remarks show that he has overlooked the most important elements in a comparison between the glaciated districts of Europe and the Himalayan region—*viz.*, the difference in the character of the rocks and the prodigious disparity of denudational action in the two regions. It is true he appeals to the latter in the form of floods as the motive power by which the Kangra erratics have been torn from the distant peaks and scattered over the plains, but wholly loses sight of it, when insisting on the absence of striated rocks and other surface indications relied on in Europe to establish the former extension of glaciers. The two arguments are mutually destructive, for a succession of such terrific debacles as could alone have effected the transportation of blocks up to 140 feet in girth, could have had no other effect than to obliterate all traces of the ice plough, on the absence of which Mr. Campbell relies, to disprove the extension of the old glaciers.

Again, from the weight which Mr. Campbell attaches to the absence of striation in the rocks of the Kangra district, it is clear that he has failed to recognise the very obvious fact, that the rock (a granitoid gneiss) which has afforded the main bulk of the Kangra erratics is by its mineral character, incapable of affording the proofs sought for, since under atmospheric action it scales off and weathers into rounded masses which retain scarcely a trace of the original surface, which they possessed as ice-borne fragments. A similar inappreciation of the most obvious physical considerations involved in the problem of the past history and conditions of the rocks he was examining is betrayed by Mr. Campbell's searching the coarse boulder conglomerates, both of the Sivalik group and its overlying deposits, and the river shingle at Hardwar on the Ganges for striated blocks, where both the conditions and materials are such as to afford about as much chance of finding glacial striation on the pebbles (had such ever once existed,) as would be offered to any one searching with a similar object the boulders of the Chesil bank and Portland roads. As regards direct differences of opinion touching the facts of the case, Mr. Campbell says he could discover no 'perched' blocks. Mr. Medlicott, who it may be supposed knows a 'perched' block when he sees one, was more fortunate. Equally unable was Mr. Campbell to find even "one hog-backed ridge," the form which I have said distinguishes the best marked moraines in Kangra. One such is at Dhada, and here Mr. Campbell could see nothing but a V gorge. Now the V gorge is there I admit; but it is cut out of the huge linear talus, hog-backed in section, which, I hold, marks the course of an old moraine. It is this Dhada section, as interpreted by Mr. Campbell, which shows that he has wholly failed to grasp my idea of the palæogeography of the district. Mr. Camp-

bell's words are, "Close to the bridge I found a section of the 'big stone formation' and got to the solid rock surface under it, newly exposed in a gravel pit. The stuff is sorted in layers of varying coarseness from fine angular sand to the big stones. The bed is *not* glaciated. The thickness of the deposit may be 80 to 90 feet."

Now if Mr. Campbell had studied my paper carefully, he would have seen that I place the level along which the old glaciers descended, at approximately 150 feet *above* the present stream beds; and as the thickness of the whole mass at Dhada is placed by him at 90 feet, the great bulk of this moraine has at this spot suffered rearrangement by water and subsidence, the original bed along which it descended, and where alone glaciation might be looked for, having been much above the existing surface level of the country; this *rather* important element in my view of the case Mr. Campbell entirely overlooks, and actually confounds together the present V gorge with the long-vanished slopes, over which the glaciers descended, at a level roughly estimated by me at 150 feet above the present river beds.

This last estimate is of course conjectural and open to modification, but it represents the amount of vertical erosion since the retrocession of the glaciers and must be very considerable.

Lastly, I would say that I neither underrate or question the power of water confined in a gorge to move very large blocks. Mr. Campbell uses the term rather vaguely, though he specifies blocks of 14 and 15 feet diameter, or say roundly 50 feet in girth. These and much larger ones may, I repeat, be moved *down a gorge* by the action of water, but when one finds blocks ranging from 100 to 140 feet in girth standing in open ground, I frankly confess I can recognise no vehicle of transport equal to the occasion save ice.

Without going into details, there is one important correction which I may here make as regards the relative age of the glacial period in Kangra and the Sivalik group. In my paper I incline to the post-glacial age of the group, on confessedly inadequate evidence. Since then, the occurrence of what I hold to be glacial debris, strewn over the denuded edges of Sivalik strata, has led me to accept the view, so ably urged by Mr. Medlicott in his note to my paper, which identified the glacial period in Kangra with that of European Geology, and if this be so, I see no grounds for questioning the former extension of glaciers in India, on as grand or even far grander scale than they attained in the comparatively dwarfish ranges of Europe—though my largest estimate dwindles to insignificance before the vision of the great ice-cap 10,000 feet thick, stretched from the equator to the pole, which Mr. Campbell has (somewhat unnecessarily in my opinion) laboured to efface. The correlation too, of the Kangra glacial period with the European does away with the necessity of supposing a former

elevation of the country, equivalent to a reduction of temperature calculated by Mr. H. F. Blanford at about 20° Fahr., and reduces the difficulties surrounding the question, and the differences of opinion of all save extreme anti-glacialists within very much narrower bounds.

3. *Remarks on the Abstract and discussion of Dr. O. Feistmantel's Paper, entitled "Giant-Kettles (pot-holes) caused by Water-action in Streams in the Rájmahal Hills, and Barákar district." By V. BALL, M. A., F. G. S., Geological Survey of India.*

As I was not present at the meeting of the Society in March when the above-mentioned paper by Dr. Feistmantel was read, I wish it to be understood that the following remarks are based on the published abstract* of the paper and the account of the discussion which followed it.

Dr. Feistmantel claims for his observations an originality and importance which, I think, I shall be able to shew they do not possess.

Ordinarily speaking, if an author can be found to write and a Society to print a paper on a subject like the above, there might perhaps be no good reason for special remark or criticism. The paper may be in itself a valuable contribution to knowledge. It is because the writer, inferentially if not directly, casts a slur upon a Department, and the Society is one in which many of the members of that Department take a warm interest—that the occasion seems a fitting one for protest.

If the phenomena were of such rarity and importance as is stated, it would have been an act of grave omission on the part of the officers of the Geological Survey not to have described them in full detail on every occasion that they met with them.

A geologist, in India especially, where large areas have to be described, must however use some judgment in the selection of phenomena for description. I think I may say that Pot-holes are one of those which may safely be relegated to a minor position and passed with little or no notice.

The origin of many simple phenomena of denudation, erosion or deposition are subjects suitable for description in elementary manuals; but if all this A. B. C. is to be reopened and discussed and supported by tables of measurements in every descriptive memoir; what will be the length of such pre-Raphaelite descriptions? and where will they find a period?

I am sure there is not a member of the Geological Survey who would not be ready to support the statement made at the meeting by Mr. H. Blanford to the effect that "the phenomena were exceedingly common and their explanation generally obvious." This assurance one would have thought, from so competent an authority, ought to have been suffi-

* P. A. S. B. March, 1877, pp. 77-79.

cient to settle the question ; but as Dr. Feistmantel has expressed a doubt regarding its correctness I purpose to give some evidence on the subject.

My reason for taking upon myself this somewhat ungracious task, is that the statements made in the paper appear to affect me slightly more directly than they do most of my colleagues. Before my recently published memoir on the Rajmahal hills went to press, Dr. Feistmantel described to me the pot-holes he had observed in that part of the country. Apparently he quite forgets that I told him that I had not only observed them there, but also in many other parts of India.

It would be very much easier to enumerate a list of places where pot-holes are to be found in India than to produce a similar number of published notices of them, simply because they have not been thought worthy of mention. They are just the objects which would be likely to attract the notice of an amateur, while weightier and more important phenomena were left to explain themselves. It is no matter for surprise, therefore, that Dr. Feistmantel should find a reference to an amateur who has mentioned pot-holes, but it is very great matter for surprise that he should not have very carefully examined the publications of the Geological Survey before permitting himself to make the statements he appears to have made in reply to Mr. Blanford. Two of the references I shall give are to papers published since Dr. Feistmantel's arrival in India. It is possible that the Memoirs and Records may contain others, if they do not, it is for the reason above given. Out of the Survey publications too, there are at least two known references to the subject ; but I shall confine myself to the officers of the Survey for affording evidence of the abundance and very general distribution of Pot-holes in India.

The first witness I propose to quote is Dr. Feistmantel himself. Since his arrival in India he has on two occasions *only* made short tours in the rocky districts of Bengal. On both these occasions he has, in totally different formations, observed series of pot-holes which have supplied the text for his paper. Yet in spite of this fact and positive assurance to the contrary, he maintains that the phenomena must be of rare occurrence in India.

Of published notices by officers of the Survey I only quote four, the first two have been pointed out to me, the others were known to me for reasons that will be obvious. In the *Geology of Trichinopoly, &c.*, by Messrs. King and Foote, we find the following passage: "In the first small nullah which runs under the high road about $1\frac{1}{2}$ miles east of Vellum, and reaches the low ground to the north of Pullayaputty, are several small but well marked and instructive examples of pot-holes formed by the grinding action of pebbles rapidly rotated by the eddies in the stream. In several of the pot-holes the pebbles were still lying, the force of the

stream not having been sufficient to wash them out of the steep-sided holes they had been instrumental in scooping." In his recently published account of the South Mahratta country,* Mr. Foote has mentioned pot-holes twice.

Describing the remarkable scenery in the neighbourhood of the falls of Gokak on the Ghatpraba river, he writes "For some distance above the fall, the water runs at a very great pace, and has in consequence worn many fine specimens of pot-holes in the very hard quartzite, some beds of which, both here and in many neighbouring sections, are typical 'waxy' quartzites showing beautifully preserved rippling. These pot-holes are very favourite bathing-places for numerous Brahmans and others, who perform semi-religious pic-nics at this lovely spot in honor of Malingeswar" (p. 88). Again speaking of the Malprabha river we find—"During great floods the water rises from 30 to 40 feet in the gorge, and flows with great impetuosity, forming numerous pot-holes of great size and depth which, as at the Gokak falls, are at certain seasons largely resorted to by Hindus anxious to wash away their sins in the purifying river." (p. 99.) There is nothing here to suggest that Mr. Foote regarded the phenomena as exceptional or requiring any elaborate explanation.

In the year 1864, shortly after my arrival in the country, I joined Mr. Hughes who was at that time engaged in the examination of the Bokaro coal-field. I can remember very distinctly being much struck with the pot-holes we met with in several river-beds, and on turning to Mr. Hughes' memoir, I find the following allusion: "The felspathic sandstone holds steadily on down the stream, worn into hollows of every conceivable shape: pot-holes meet one at every step."†

In my description of the Raigarh and Hingir Coal-field,‡ when pointing out the lithological and structural characters of the upper sandstones (Kamthis), I have written as follows—"Mechanically formed pot-holes are, for some reason which I cannot explain, less common than in the Barákar rocks."

Here, it will be observed, I have made the scarcity of these pot-holes a subject for comment, an abundance of them being the more normal state of things.

Dr. Feistmantel has expressed an unwillingness to receive assurances that these are common phenomena unless such assurances are accompanied by accurate measurements. Such details I am not at the present moment prepared to give, but I must assert here, most positively, that there is not a single formation in India which I have examined, in which, where the

* Memoirs, Vol. XII.

† Memoirs, Vol. VI, p. 91.

‡ Records, Vol. VIII. p. 114.

conditions have been favourable, I have not observed pot-holes. I can recall very many localities, some of them met with only during the present year, in quartzites of Vindhyan age.

Pot-holes may be rare in European streams from various reasons, but where the conditions are favorable they must, like other forms of erosion, irresistibly be produced. Although unable to quote instances from personal observation in streams, I have seen not a few on the sea coast where the necessary movement to the pebbles is caused by the ebb and flow of the tide or by currents. Some of those that I can remember were in Cambrian quartzites in the Bay of Dublin, where they often formed natural aquaria which could be visited at low tide and generally yielded marine animals. When the growth of weeds or zoophytes at the sides or bottom prevents the further revolution of pebbles, such pot-holes cease to increase their dimensions.

In limestone rocks similar holes may at times be observed, but though in some cases mechanical action may have had much to do with their formation, chemical solution may have been the more efficient factor.

For the benefit of any future historian I add the following facts which may find a place in a chapter on the economic uses subserved by pot-holes in India. Besides their more common employment as bathing-places and substitutes for clothes-washing tubs, the smaller ones are much used by the jungly aboriginal tribes for preparing the wild arrow-root or *tekûr*. The roots are pounded and crushed in these natural mortars, the stringy portions are removed and the farinaceous fuculæ allowed to subside at the bottom of the water. My attention has frequently been drawn to this mode of using them by the peculiarly offensive odour which arises from the refuse in this manufacture. They are also often used for steeping the roots or bark of certain trees the decoction from which is employed largely in poisoning fish in the streams.

Dr. FEISTMANTEL said he was very much obliged to Mr. Ball for the information regarding the mentioned cases of pot-holes which he had omitted to notice, he greatly regretted not having known them, but they still did not prove that the pot-holes are so worthless and uninteresting a subject as it would seem from the remarks of Mr. Ball and Mr. H. F. Blanford, the more so, if we consider all the papers which have been written by well-known authors on this subject, not only on pot-holes unconnected now with any water action, but also on those formed at present in streams and under glaciers. His only intention was and is, to describe and illustrate properly some cases of Indian pot-holes (which up to date has not been done) that might be referred to in future, and that European geologists may know of instances of pot-holes in India, which they certainly will not consider as completely without interest; the sketches will prove still more interesting.

He regretted the more having omitted to quote the "*en passant*" notices of pot-holes in the Survey Memoirs, as they gave to Mr. Ball the occasion for his remarks, in which, however, that gentleman has not added any explanation on the subject, but on the contrary has treated it quite as a personal affair.

While admitting that he had been ignorant of four or five mentions of pot-holes, he imagined that Mr. Ball was unacquainted with a much larger series of papers treating on this subject, which he would therefore recommend to his consideration (Dr. Feistmantel read a list of these papers). They all show that pot-holes were considered *worth description* from long ago up to the present date, although they are so common; even the most common phenomena must be described in order to be known.

Therefore, Dr. Feistmantel said, his principle would always be to *examine all phenomena, even if they be very common*, as circumstances may often make them become very important, as an instance of which he might mention the re-discovery of *Glossopteris*, thought by some authors palæozoic, in the Keuperic Panchet group, and the discovery of *●* in the Middle Jurassic Jabalpur group, on which he would have something to say on a future occasion.

Mr. H. F. BLANFORD drew attention to the report of Dr. Feistmantel's remarks in the March Proceedings of the Society, and especially the following passage "Dr. Feistmantel said he very much doubted whether Mr. H. F. Blanford's statements that these pot-holes are exceedingly common, is correct; otherwise they would have been more frequently noticed and described." Dr. Feistmantel's industry in collecting the very long list of papers on the subject, only a portion of which time would allow of his even enumerating by their titles, had now afforded the most complete refutation of the grounds of his opinion above given, that could possibly be desired; and, as regards India, Mr. Ball's paper just read, would probably be thought equally conclusive. In his own remarks, to which Dr. Feistmantel had taken objection, he had however spoken only of the results of his personal experience. In North Wales, where he had done his earliest work in field geology, pot-holes were exceedingly common; in Cornwall, where his next work was done, they were also very common; and in every part of India in which it had been his fortune to work at field geology, the same rule held good.

It is then amply established that in Europe, as in India, pot-holes in streams are so common, that it is rather a matter for surprise that there is such an extensive literature on the subject as Dr. Feistmantel has adduced. In part, this is perhaps due to the somewhat undue attention given to minutiae in certain schools of Geology. He had accompanied one of the writers quoted by Dr. Feistmantel, in geological excursions with his class,

and having himself then recently left the School of Mines in London, he had been much struck with what appeared to him to be the undue amount of attention given to little details, which any one might observe for himself, and the slight amount of attention given to the geological structure of the country, its orographical features and similar matters of high importance, but less obvious, especially to students. But he also thought it probable that Dr. Feistmantel had somewhat confused his authorities. The formation of pot-holes in streams was an obvious phenomenon, which is almost too common to deserve notice, but he understood that the point of many of the communications enumerated by Dr. Feistmantel was, that the holes described occurred in places where it was impossible to account for them by stream action, which is a very different matter; and which would furnish a reasonable ground for describing them. But in that case, they were clearly irrelevant as affording a justification for the publication of elaborate descriptions of pot-holes occurring in streams.

Mr. W. T. BLANFORD said,—I agree fully with Mr. Ball, and I can confirm his remarks on the common occurrence of pot-holes both in streams and on the sea coast. I believe it would be difficult to find a rocky stream in the country in which none occur. He is undoubtedly correct also in the reasons he has assigned for the paucity of notices of those phenomena in the published memoirs of the Survey. It would be absurd to devote space to the record of useless details about a common form of erosion with which geologists are familiar, and which has been well known and explained in elementary works for at least a quarter of a century.

The greater part of the papers by European geologists which are quoted by Dr. Feistmantel appear to me to refer to a different subject. He has described pot-holes in streams, with which all field geologists are well acquainted, and the origin of which is obvious; the European and American writers have described holes on hill sides, and even on the summit of a watershed, a very different matter. The latter is the case with the papers by Brögger and Reusch, Helmersen, and Jackson, or with three out of the five papers mentioned by Dr. Feistmantel in the Proceedings, and the other two are only short notes.

Mr. BALL said:—After the remarks of Mr. H. Blanford and of the Chairman I do not think there is anything left for me to reply to. Dr. Feistmantel's paper may be a valuable one, that is not the question. My object has simply been to point out certain errors of fact published in the Proceedings. I have to regret that Dr. Feistmantel has not, apparently, quite understood this to be the sole object of my paper, and has not availed himself more completely of the opportunity which has now been afforded him of withdrawing his former statements, which are justly objected to by, I believe, most of the members of the Geological Survey.

4. *Some notes on Birds of the Genera Pellorneum and Pomatorhinus, with a description of a variety of Chleuasicus ruficeps, Blyth.* By MAJOR H. H. GODWIN-AUSTEN, F. R. G. S.

Since writing the remarks on the genus *Pellorneum* published in Part II, No. 1 of the Journal for this year, I have, I think, determined a bird among those collected by Mr. Ossian Limborg on and under the Mulé-it range, Tenasserim, as the *Pellorneum Tickelli* of Blyth, originally from the same locality, where it was obtained by Capt. Tickell. This is not a *Pellorneum* but should, I consider, be placed in the genus *Alcippe*.

Its having been first placed in the genus *Pellorneum* is, I suspect, the reason (as it was in my own case) of the considerable confusion that has arisen regarding it, and led me and others to think *Pellorneum Tickelli* possessed the striated frontal plumage seen in typical *P. ruficeps*. Blyth commences his description of *P. Tickelli* by saying "absolutely identical in structure with *P. ruficeps*"; this, though it is clear enough on careful reading that Blyth was not alluding to coloration, yet brings *P. ruficeps* and its allies vividly to the mind. No mention is made of any markings on the breast; the description being in fact that of a dull-plumaged bird about which very few lines could be given. Mr. Oates appears to have recognized the species, and, in his list of Birds from Upper Pegu (Stray Feathers, Vol. III. p. 119), finds fault with the describer by saying—"agrees pretty well with Blyth's meagre description"; but this meagre description is almost as much as could be written about so dull-plumaged a bird, and, supplemented by that of Captain Tickell, is ample. In fact, it applies exceedingly well, even to the measurements, to the specimens we have lately received, and of which I give some account and the dimensions below. When this identification was made, I remembered that in the Museum we possessed two very similar mounted but unnamed birds (No. 852a), the history of which had been lost; on comparison they proved identical with the Tenasserim form and are very probably the original type specimens, the labels of which have been destroyed since Blyth described them.

Mr. Oates, in S. F. Vol. IV, p. 406, again calls attention to the two birds, and in continuation of his original identification of *Pellorneum Tickelli*, gives some account of the specimens in his possession, but he is perfectly wrong and unjust in his strictures when he takes Lord Tweeddale to task for making *P. Tickelli* equal to *P. subochraceum*, for if he will turn again to J. A. S. B. 1875, p. 114, he will find that it was Mr. Blyth who made this identification.

Lord Tweeddale had never seen a specimen of *P. Tickelli* but naturally thought that Blyth knew his own species. Therefore, assuming Mr. Blyth was right, and as *P. minor* (*rectius minus*) and *P. subochraceum* were known

to be the same, the next species was referred to *Tickelli*; and only this part appears within brackets. The 4th *Pellorneum* in my last paper should stand as *P. subochraceum*, Swin., originally described from Tenasserim, while *P. Tickelli* should be removed to the genus *Alcippe* with its near allies, *A. Phayrei*, *A. affinis*, *A. albogularis*, &c.

ALCIPPE TICKELLI, Blyth.

Desc.—Above all olivaceous brown, wings and tail more of an umber-colour, the feathers of the head and back are very indistinctly pale-shafted; frontal margin, lores, and round the eye, buff with a ruddyish tinge; the same ochraceous colour tinges the chin and throat and under parts, darker on the flanks and whitish on centre of the abdomen.

Bill above horny brown, pale fleshy white below. Irides light brown.

Length about 4·8; wing 2·5; tail 2·1; tarsus 1·0, bill at front 0·60 inches.

HAB.—Near Mitán on the Houngdarao River, Tenasserim.

A specimen of *Pomatorhinus hypoleucus*, var. Blyth = *Tickelli*, Hume, lately described in *Stray Feathers*, Vol. V. p. 32, in the middle of 'A List of Birds of North Eastern Cachar', is in the Indian Museum among Blyth's types, together with the two type specimens of true *P. hypoleucus* from Arakan sent by Capt. A. Phayre. The specimen agrees in measurement and in every way with the original description and is undoubtedly the very bird Blyth described. It is a well marked species. With regard to Mr. Hume's *Pom. Inglisi* described in the same publication, I may state that the description of *P. hypoleucus* in the 'Ibis', was made by Jerdon from a bird in my collection obtained at Asálu in the North Cachar Hills when Dr. Jerdon was staying with me at Cherra Púnjí in 1869; and I have a water-colour sketch of the head of the bird made just after it was shot. I think it premature to separate this from the Arakan bird until we can compare it with fresh examples from the original locality. The two type-specimens mentioned above are not in a state to enable us to do this in a satisfactory manner, having become bleached—the whole upper parts being of the same rusty hue throughout and all the grey having vanished from out of the lower plumage. The amount of rufous on the side of the head is a varying quantity. In my Asálu bird it is, as described by Mr. Hume, very faintly indicated, and Jerdon, not always very minute in his descriptions and with sight then becoming impaired, overlooked it. In specimens I now have by me, from the Nágá Hills, many miles to the east, the rufous patch on the neck and the rufous line from behind the eye are very strongly and intensely developed.

CHLEUASICUS RUFICEPS, Blyth, var. ATROSUPERCILIARIS.

No mention being made of the black eyebrow in the original description

of *C. ruficeps*, and finding it absent in the type in the Indian Museum, I now describe the variety from Sadiya, Upper Assam.

Desc.—Bright ferruginous on the head, same colour paler on the nape and ear-coverts; back and wings pale olive-brown; quills tinged rufous; tail brown; a narrow black streak over the eye beneath dull white with an earthy tinge.

Legs dark plumbeous.

Length about 6; wing 2·85; tail 3·3; tarsus 0·90; bill at front 0·48 inches.

Larger than *Ch. ruficeps* and not so white below.

Mr. W. T. BLANFORD said he was afraid that he had been to some extent the cause of the confusion about *Pellorneum Tickelli*. Some years ago, he had suggested (Ibis 1872, p. 87) that *Pellorneum subochraceum* of Swinhoe was the same species. Dr. Jerdon went rather farther and, in his 'Supplementary Notes', stated that the two species had been pronounced identical. The same view was accepted by Mr. Blyth in his 'Mammals and Birds of Burma.' It is therefore not surprising that, when *P. subochraceum* was re-discovered, Mr. Hume gave it a fresh name and called it *P. minor*. It is most satisfactory to have obtained again typical specimens of both species from the original locality and to have cleared up the synonymy.

5. *On an apparently undescribed Weasel from Yarkand*. By W. T. BLANFORD, F. R. S.

Mr. W. T. BLANFORD gave a description of an apparently new weasel from Yarkand. A skin was contained in the collections made by Dr. Stoliczka, but as the animal had been kept in confinement, it did not appear desirable to describe it as new, and it was not quite certain that it was more than a variety of *Mustela vulgaris*. A second specimen brought by Dr. Scully, which was precisely similar to the first, had proved on more careful comparison to be considerably larger than *M. vulgaris*, besides being of a very different colour, and having a proportionably longer tail. It was proposed to name this after Dr. Stoliczka. It might be briefly described thus:

Mustela Stoliczkana, sp. nov. Pale sandy brown above, white below, tail coloured like the back throughout and about $\frac{1}{2}$ the whole length, feet well clad with long hairs beneath. Size larger than *M. vulgaris*, about equal to *M. erminea*.

Dr. ANDERSON exhibited a living, adult female Bamboo-rat which had recently been sent to the Zoological Gardens, Alipore, by Mr. A. H. Hildebrand, Asst. Commissioner, Burma. No details regarding the habitat of the animal had been as yet received, beyond that it had been obtained

from the Salwín Hill Tracts. Dr. Anderson pointed out that Sir Stamford Raffles had described a bamboo-rat, apparently from Malacca, under the name of *Mus Sumatrensis*, and that the drawing of this form by Major Farquhar to which Sir Stamford Raffles refers in his "Descriptive Catalogue* of a Zoological Collection made in Sumatra", is now in the library of the Royal Asiatic Society of London. This drawing Dr. Anderson had recently examined and he was thus enabled to state that while certain bamboo-rats from Malacca in the Indian Museum agreed with the drawing, the present living example from the Salwín Hill Tracts did not, and that there was a bamboo-rat in the Indian Museum from Tenasserim referred to *Rhizomys Sumatrensis*, but which differed from the Malacca specimens and agreed with the living animal now before the Society. Dr. Anderson was therefore inclined to consider that two species had been confounded with each other under *R. Sumatrensis*. McLelland, however, had described a bamboo-rat from Tenasserim as distinct from *R. Sumatrensis*, but Dr. Anderson had not been able to identify *R. cinerea*, McLelland, with the Museum Tenasserim specimen nor with the living animal from the Salwín Hill Tracts. This form from the Salwín and Tenasserim is distinguished from *R. Sumatrensis* by its bright golden red cheeks and sides of the head generally, by the absence of white spots on the forehead, and by the dark iron-grey of the upper parts (many of the hairs being white-tipped) becoming almost black on the top of the head, where it abruptly ceases between the eyes in a sharp well-defined point. The upper lip, chin, and upper part of throat white, also the chest and belly, which are, however, more or less tinged with grey and reddish. Lower portion of throat dark grey. The feet are sparsely clad and leaden coloured, except the toes of the hind foot, which are fleshy white. The tail is rather thick at the base, quite naked, not scaly, and of a leaden hue. Claws rather broad and moderately strong.

Measurements of the living adult ♀ specimen

Tip of nose to ending of hair over root of tail,.....	14.75	
Ending of hair of body to tip of tail,	5.35	•
Length of hind foot,	2.56	
Height of ear,	0.80	
Breadth of ear,.....	0.64	•
Tip of nose to anterior angle of eye,	1.31	*
Posterior angle of eye to ear,.....	1.29	•
Length of eye,	0.39	
Breadth between eyes,.....	1.38	
" " external margin of nostrils,	0.50	
" " ears,	2.10	
" of tail at base,	0.77	

* Trans. Lin. Soc. London, Vol. XIII (182), p. 258.

If *R. cinereus* does not prove to be distinct from *R. Sumatrensis*, Dr. Anderson proposed to designate this red-cheeked bamboo-rat *Rhizomys erythrogenys*.

LIBRARY.

The following additions have been made to the Library since the Meeting held in June last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS, presented by the respective Societies or Editors.

Bombay. The Indian Antiquary,—Vol. VI. Pts. 67, 68, 1877.

Pt. 67. *J. W. McCrindle*.—The Fragments of the Indika of Megasthenes. *J. F. Fleet*.—Sanskrit and Old Canarose Inscriptions. *Rev. R. Caldwell*.—Substance of two Sâsanas in Sir Walter Elliot's collection of South Indian Inscriptions.

Pt. 68. *Dr. G. Bühler*.—Three new Edicts of As'oka.

Boston. The Boston Society of Natural History,—Memoirs, Vol. 2, Pt. 4, Nos. 2 to 4.

———, ———, —Proceedings, Vol. 17, Pts. III and IV. Vol. 18. Pts. I and II.

Vol. 17. Pt. III. *S. H. Scudder*.—Notes on Orthoptera from Northern Peru. *A. Hyatt*.—Jurassic and Cretaceous Ammonites from South-America. *R. Bliss, Jr.*.—Remarks on the Fin-spines of the Siluroides and Doradoids. *H. A. Hagen*.—History of the Development of Museums of Natural History.

Pt. IV. *S. H. Scudder*.—A century of Orthoptera.—On Sparagemon, a genus of *Ædipodidae*. Revision of two American Genera of *Ædipodidae*. *J. H. Emerton*.—Structure of the Palpus of male Spiders.

Vol. 18, Pt. I. *J. W. Putnam*.—On the Habits of the Blind Crawfish, and the Reproduction of lost parts. *S. H. Scudder*.—On Fossil Insects from Cape Breton.

Pt. II. *W. K. Brooks*.—Embryology of Salpa. *Prof. J. D. Dana*.—On Metamorphism and Pseudomorphism.

———, ———, —Occasional Papers, No. 2.

Dr. N. M. Hentz.—The Spider of the United States.

———, ———, The American Academy of Arts and Sciences,—Proceedings, Vol. III., 1875-76.

L. Trouvelot.—On the Veiled Solar Spots. *Prof. E. C. Pickering*.—Height and Velocity of Clouds.

Calcutta. The Calcutta Journal of Medicine,—No. 5, 1876.

———, Geological Survey of India,—Records, Vol. X, Pt. 2, 1877.

V. Ball.—On the "Atgarh Sandstones" near Cuttack. *Dr. O. Feistmantel*.—Notes on Fossil Floras in India.

Cherbourg. Société Nationale des Sciences Naturelles de Cherbourg.—Compte-Rendu de la séance extraordinaire tenue par la Société le 30

Décembre 1876, à l'occasion du vingt-cinquième anniversaire de sa fondation.

Dublin. The Dublin University Biological Association.—Proceedings, Vol. I, No. 2, 1874-75.

Prof. Macalister.—On two new species of Mites.

Leipsic. Der Deutsche Morgenländische Gesellschaft,—Zeitschrift, Band 80. Heft 4.

E. Haas.—Ueber die Ursprünge der Indischen Medizin mit besonderem Bezug auf Susruta. *D. H. Müller.*—Himjarische Studien.

London. The Athenæum,—Nos. 2581—2585, 1877.

———. The Geographical Magazine,—Vol. 4, Nos. 4 and 5, 1877.

No. 5. The Famine in Madras and Bombay. *C. R. Markham.*—The Himalayan System.

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*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of March 1877.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	30.005	30.072	29.949	0.123	76.0	87.0	66.0	21.0
2	29.975	.052	.923	.129	76.5	87.0	67.0	20.0
3	30.000	.078	.942	.136	77.7	88.0	67.5	20.5
4	29.920	29.988	.843	.145	77.5	86.5	69.0	17.5
5	.864	.929	.787	.142	78.3	86.5	73.5	13.0
6	.880	.942	.804	.138	79.2	88.5	73.5	15.0
7	.918	.996	.854	.142	77.9	88.0	68.5	19.5
8	.934	30.004	.860	.144	79.0	88.5	71.0	17.5
9	.906	29.973	.847	.126	79.1	87.2	71.5	15.7
10	.880	.947	.798	.149	80.1	90.0	74.0	16.0
11	.882	.948	.830	.118	79.3	88.8	71.5	17.3
12	.905	.967	.864	.102	80.0	89.5	73.5	16.0
13	.964	30.066	.905	.161	81.0	88.5	76.2	12.3
14	.954	.027	.899	.128	81.5	92.2	71.5	20.7
15	.952	.000	.905	.095	81.2	90.5	74.6	15.9
16	.944	29.999	.905	.094	76.9	84.2	72.5	11.7
17	.954	30.032	.874	.158	73.8	83.0	66.5	16.5
18	.933	29.986	.854	.132	77.3	86.0	70.0	16.0
19	.910	.980	.832	.148	79.0	88.0	71.8	16.2
20	.863	.929	.791	.138	80.7	89.0	74.0	15.0
21	11.802	.871	.739	.132	81.7	90.0	76.0	14.0
22	.778	.836	.725	.111	83.4	93.9	76.0	17.9
23	.838	.923	.765	.158	83.8	93.8	77.0	16.8
24	.883	.949	.801	.148	83.1	92.9	77.0	15.9
25	.873	.951	.802	.149	80.5	88.0	76.4	11.6
26	.878	.953	.807	.146	81.3	90.5	74.5	16.0
27	.856	.938	.783	.155	81.9	90.0	76.4	13.6
28	.837	.957	.772	.185	78.3	80.5	75.8	4.7
29	.812	.890	.763	.127	83.1	92.2	76.3	15.9
30	.892	.949	.836	.113	78.3	85.5	71.0	14.5
31	.917	30.016	.839	.177	76.3	81.2	74.0	7.2

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means, are derived, from the hourly observations, made at the several hours during the day.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of March 1877.*

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued.)

Date.	Mean Wet Bulb monometer.	Wet Bulb above Wet.	Computed Dew Point	Dry Bulb above Dew Point.	Mean Elastic Force vapour.	Mean Weight of Vapour in a Cubic f of air.	Additional Weight of Vapour required for state saturation.	Mean degree of Humidity, complete saturation being unity.
	°	°	°		Inches.	Gr.	Gr.	
1	84.9	11.1	57.1	18.9	0.475	5.16	4.44	0.54
2	85.5	11.0	57.8	18.7	.488	.27	.48	.54
3	86.8	10.9	59.2	18.5	.509	.51	.59	.55
4	88.0	9.5	61.3	16.2	.546	.92	.12	.59
5	71.6	6.7	66.9	11.4	.657	7.12	3.16	.69
6	73.4	5.8	69.3	9.9	.711	.67	2.89	.73
7	70.6	7.3	65.5	12.4	.628	6.81	3.35	.67
8	72.8	6.2	68.5	10.5	.692	7.48	.02	.71
9	74.6	4.5	71.4	7.7	.761	8.22	2.31	.78
10	75.5	4.6	72.3	7.8	.783	.44	.40	.78
11	74.4	4.9	71.0	8.3	.751	.12	.47	.77
12	75.3	4.7	72.0	8.0	.776	.36	.45	.77
13	72.9	8.1	67.2	13.8	.664	7.14	4.00	.64
14	71.3	10.2	64.2	17.3	.601	6.46	.85	.57
15	71.2	10.0	64.2	17.0	.601	.46	.75	.58
16	69.5	7.4	64.3	12.6	.603	.55	3.31	.66
17	66.8	7.0	61.9	11.9	.557	.08	2.90	.68
18	71.4	5.9	67.3	10.0	.666	7.22	.76	.72
19	72.5	6.5	67.9	11.1	.679	.34	3.16	.70
20	75.6	5.1	72.0	8.7	.776	8.35	2.69	.76
21	77.4	4.3	74.4	7.3	.838	9.02	.35	.79
22	77.4	6.0	73.2	10.2	.806	8.64	3.32	.72
23	77.6	6.2	73.3	10.5	.809	.65	.45	.72
24	77.6	6.5	72.0	11.1	.776	.31	.55	.70
25	75.0	5.5	71.1	9.4	.753	.13	2.85	.74
26	72.9	8.4	67.0	14.3	.659	7.10	4.14	.63
27	77.1	4.8	73.7	8.2	.819	8.82	2.62	.77
28	73.9	4.4	70.8	7.5	.748	.07	.21	.79
29	73.3	9.8	66.4	16.7	.646	6.93	4.93	.58
30	71.9	6.4	67.4	10.9	.668	7.23	3.05	.70
31	70.5	5.8	66.4	9.9	.646	.03	2.66	.73

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of March 1877.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid- night.	29.909	30.024	29.786	0.238	75.6	79.2	71.5	7.7
1	.901	.018	.782	.236	74.9	79.0	66.5	12.5
2	.890	.008	.772	.236	74.4	78.8	67.0	11.8
3	.880	29.998	.760	.238	73.9	78.3	66.8	11.5
4	.872	.990	.742	.248	73.7	78.0	66.6	11.4
5	.885	.998	.750	.248	73.3	77.8	66.6	11.2
6	.902	30.014	.760	.254	72.9	77.5	66.4	11.1
7	.923	.033	.785	.248	73.2	78.0	66.0	12.0
8	.949	.056	.808	.248	75.4	79.5	68.5	11.0
9	.964	.078	.828	.250	78.8	83.5	70.8	12.7
10	.964	.077	.832	.245	81.3	86.0	74.0	12.0
11	.955	.068	.836	.232	84.0	89.5	78.0	11.5
Noon.	.934	.044	.811	.233	85.9	92.5	77.6	14.9
1	.906	.013	.782	.231	87.0	93.7	78.0	15.7
2	.881	29.984	.766	.218	87.3	93.9	72.5	21.4
3	.858	.959	.746	.213	87.5	93.6	75.2	18.4
4	.843	.949	.734	.215	87.2	93.8	78.2	15.6
5	.841	.954	.725	.229	86.0	91.7	78.5	13.2
6	.853	.949	.727	.222	83.7	89.2	76.5	12.7
7	.863	.962	.742	.220	80.9	85.0	75.3	9.7
8	.886	.977	.766	.211	79.2	83.5	74.5	9.0
9	.907	.999	.784	.215	78.0	82.4	74.0	8.4
10	.922	30.008	.796	.212	77.1	81.0	73.0	8.0
11	.919	.016	.794	.222	76.2	80.0	72.0	8.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means, are derived from the observations made at the several hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Catantla,
in the month of March 1877.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued).

Hour.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humi- dity, complete satura- tion being unity.
	°	°	°	°	Inches.	Gr.	Gr.	
Mid- night.	71.8	3.8	69.1	6.5	0.706	7.67	1.81	0.81
1	71.4	3.5	68.9	6.0	.701	.65	.63	.82
2	71.2	3.2	69.0	5.4	.704	.68	.47	.84
3	70.9	3.0	68.8	5.1	.699	.63	.38	.85
4	70.8	2.9	68.8	4.9	.699	.63	.33	.85
5	70.7	2.6	68.6	4.7	.695	.59	.25	.86
6	70.5	2.4	68.6	4.3	.695	.61	.12	.87
7	70.9	2.3	69.1	4.1	.706	.72	.10	.88
8	71.9	3.5	69.4	6.0	.713	.77	.66	.82
9	72.8	6.0	68.6	10.2	.695	.52	2.92	.72
10	73.1	8.2	67.4	13.9	.668	.18	4.06	.64
11	73.7	10.3	66.5	17.5	.648	6.93	5.24	.57
Noon	73.9	12.0	65.5	20.4	.628	.70	6.17	.52
1	73.7	13.3	65.7	21.3	.632	.73	.56	.51
2	73.5	13.8	65.2	22.1	.621	.61	.80	.49
3	73.7	13.8	65.4	22.1	.626	.64	.85	.49
4	73.9	13.3	65.9	21.3	.636	.76	.61	.51
5	74.1	11.9	65.8	20.2	.634	.76	.15	.52
6	74.2	9.5	67.5	16.2	.670	7.18	4.89	.60
7	73.6	7.3	68.5	12.4	.692	.47	3.63	.67
8	73.2	6.0	69.0	10.2	.704	.60	2.96	.72
9	72.6	5.4	68.8	9.2	.699	.57	.62	.74
10	72.2	4.9	68.8	8.3	.699	.59	.33	.77
11	72.1	4.1	69.2	7.0	.708	.70	1.96	.80

All the Hygrometrical elements are computed by the Greenwich Constants.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of March 1877.*

• Solar Radiation, Weather, &c. •

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	WIND.			General aspect of the Sky.
			Prevailing direction.	Max. Pressure.	Daily Velocity.	
	°	Inches		lb	Miles.	
1	138.5	...	W S W & N W	...	97.9	B to 4, \i to 7, B to 11 P. M.
2	140.5	...	W N W & S W	...	111.5	\i to 5, \i to 7 A. M., B to 11 P. M.
3	142.0	...	N & S W	...	104.2	B to 7, \i to 9 A. M., B to 1, \i to 6, B to 11 P. M.
4	141.5	...	S W	...	82.8	B to 7 A. M., \i to 8, S to 11 P. M.
5	144.0	...	S W & S S W	...	102.2	S to 6, O to 8, \i to 11 A. M., \i to 5, B to 11 P. M.
6	141.7	0.03	S by W & S S W	1.6	179.5	O to 7 A. M., \i to 4, B to 6, S to 11 P. M. L from 6½ to 11 P. M. T at 7½, 10 & 11 P. M. Light R at 8 & 10½ P. M.
7	142.0	...	S S E & N W	...	204.0	\i to 4, B to 11 P. M. L at Midnight, D at 7 & 8 A. M.
8	144.0	...	S S E & S by W	...	116.5	B to 9, \i to 11 A. M., \i to 9, B to 11 P. M. Foggy from 3 to 7 A. M.
9	142.5	...	S S W & S	...	148.4	B to 4, S to 8 A. M., \i to 4, B to 11 P. M. Foggy at 6 & 7 A. M.
10	144.0	0.02	S & S S W	...	131.2	B to 10 A. M., \i to 2, \i to 4, O to 7, \i to 11 P. M. T at 5½ P. M. L from 5½ to 10 P. M. Light R at 6 P. M.
11	146.0	...	S by E & S S W	...	191.9	B to 6, \i to 9 A. M., \i to 6, B to 11 P. M. Sheet L at 1 & 2 A. M., & from 7 to 9 P. M.
12	143.0	...	S by W & S S W	...	195.5	B to 10 A. M., \i to 7, B to 11 P. M. Sheet L on N W at 7 P. M.
13	144.7	...	S by W & W S W	1.0	164.5	S to 3, \i to 6, \i to 11 A. M., \i to 6, B to 11 P. M.
14	143.0	...	W S W & W by N	...	142.4	\i to 1 A. M., B to 1, \i to 6, B to 11 P. M.
15	145.5	...	W S W, S W & N W	...	127.5	B to 5, \i to 7 A. M., \i to 3, \i to 6, S to 11 P. M.

\i Cirri, —i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi, \i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning, R. rain, D. drizzle.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of March 1877.*

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	WIND.			General aspect of the Sky.
			Prevailing direction.	Max. Pressure	Daily Velocity.	
	°	Inches		lb	Miles.	
16	140.0	...	Variable	...	139.2	O to 10 A. M., \i to 12, O to 5, \i to 7, S to 11 P. M. Sheet L from 7 to 11 P. M. D at 6 A. M. & 8½ P. M.
17	139.5	0.70	...	40.0	158.5	O to 4, B to 9 A. M., \i to 1, B to 11 P. M. T. L & hailstone at Midnight. R at Midnight & 1 A. M.
18	143.0	...	...	...	82.4	B to 8 A. M., \i to 6, B to 11 P. M.
19	149.0	...	S S W & S by W	...	114.0	B to 8 A. M., \i to 6, B to 11 P. M.
20	146.0	...	S by W & S	...	131.0	B to 8 A. M., \i to 4, B to 11 P. M. D at 4 P. M.
21	142.0	...	S by W, SSW & S	0.3	255.0	Chiefly B.
22	146.3	...	S by W & SSW	0.2	250.2	B to 9 A. M., \i to 2, \i to 5, B to 11 P. M.
23	143.0	...	S S W & S W	...	244.3	B to 5, \i to 8, \i to 11 A. M., B to 1, \i to 4, B to 11 P. M.
24	144.8	...	S S W & S W	9.5	186.6	B to 5, Souds to 9 A. M., \i to 1, B to 3, \i to 7, O to 11 P. M. L at 8 & 9 P. M. T at 9 P. M., D at 10 & 11 P. M.
25	147.5	...	S S W & S W	0.2	164.9	O to 1, S to 6 A. M., \i to 12, S to 4, O to 6, \i to 11 P. M. D at Midnight, & 3½ P. M.
26	143.0	...	S by W	...	15 C.3	\i to 11 A. M., B to 2, \i to 7, \i to 11 P. M.
27	147.0	...	S by W & SSW	...	97.7	\i to 6, O to 10 A. M., \i to 5, \i to 11 P. M.
28	127.0	...	S S W	...	85.4	\i to 6 A. M., O to 3, \i to 11 P. M. D at 8, 10 A. M., 12 & 1 P. M.
29	143.2	...	S S W & W	...	111.3	\i to 4, O to 6, \i to 11 A. M., B to 2, \i to 7, \i to 11 P. M. Sheet L on S W at 7½ P. M. D at 9½ P. M.

\i Cirri, —i Strati, \i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i Nimbi, \i Cirro-cumuli, B clear, S strati, O overcast, T thunder, L lightning, R. rain, D. drizzle.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of March 1877.*

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.900
Max. height of the Barometer occurred at 9 A. M. on the 3rd ...	30.078
Min. height of the Barometer occurred at 5 P. M. on the 22nd ...	29.725
Extreme range of the Barometer during the month ...	0.353
Mean of the daily Max. Pressures	29.973
Ditto ditto Min. ditto	29.835
Mean daily range of the Barometer during the month ...	0.138

	°
Mean Dry Bulb Thermometer for the month	79.5
Max. Temperature occurred at 2 P. M. on the 22nd ...	93.9
Min. Temperature occurred at 7 A. M. on the 1st ...	66.0
Extreme range of the Temperature during the month ...	27.9
Mean of the daily Max. Temperature	88.2
Ditto ditto Min. ditto,	72.7
Mean daily range of the Temperature during the month ...	15.5

Mean Wet Bulb Thermometer for the month	72.5
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer ...	7.0
Computed Mean Dew-point for the month	67.6
Mean Dry Bulb Thermometer above computed mean Dew-point ...	11.9

	Inches.
Mean Elastic force of Vapour for the month	0.672

	Grain.
Mean Weight of Vapour for the month	7.26
Additional Weight of Vapour required for complete saturation ...	3.40
Mean degree of humidity for the month, complete saturation being unity	0.68

Mean Max. Solar radiation Thermometer for the month	142.5
--	-------

	Inches.
Rained 12 days,—Max. fall of rain during 24 hours	0.70
Total amount of rain during the month	0.88
Total amount of rain indicated by the Gauge* attached to the anemo- meter during the month	0.58
Prevailing direction of the Wind S S W & S by W	

* Height 70 feet 10 inches above ground.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR JULY, 1877.

The monthly General Meeting of the Asiatic Society was held on Wednesday, the 4th July, at 9-15 P. M.

RAI RAJENDRALALA MITRA, BAHÁDÚR, D. L., Vice-President, in the Chair.

The following presentations were announced :—

1. From the Author, "Religious and Moral Sentiments metrically rendered from Sanskrit writers," by Dr. J. Muir.

2. From the Home Department, Government of India. A set of Photographs of the Paintings at the Ajunta Caves, and a "Grammar of the Rong (Lepcha) Language, as it exists in the Dorjeling and Sikim Hills," by Colonel G. B. Mainwaring.

The CHAIRMAN remarked that it was in 1865 that the Society recommended to the notice of Government Colonel Mainwaring's Dictionary and Grammar of the Lepcha language, and obtained the sanction of a grant for their publication. The Society also moved the Government to allow Colonel Mainwaring to remain at Darjiling for the purpose of revising and completing his works. Circumstances had since occurred to delay the undertakings a great deal. He was, however, glad to be able to congratulate the Society on the completion of one of the works. He hoped the other would be soon out of press.

3. From the Right Hon'ble the Secretary of State for India, a copy of the Archæological Survey of Western India. Report on the Antiquities of Kathiawád, and Kach, being the result of the second season's operations of the Archæological Survey of Western India, 1874-75. By J. Burgess.

4. From the Government of Bombay, a copy of Inscriptions from the large Cave at Managhát, taken by Mr. J. Burgess.

5. From Commander A. Dundas Taylor, I. N., Superintendent of Marine Surveys, the following Charts :

False Point Anchorage. Goa and Marmagao Roadsteads. Karachi to Vingorla. Vingorla to Cape Comorin. False Point to Mutlah River. Curves of equal Magnetic Variations for 1877.

6. From Bábu Gunendranáth Tagore, an engraving of the late Mahárájá Dwarkanáth Tagore.

The following gentleman, duly proposed and seconded at the last Meeting, was elected an Ordinary Member—

Nawáb Asghar 'Alí Khán Diler-jang Bahádúr, C. S. I.

The following gentlemen are candidates for ballot at the next meeting—

C. T. Peters, M. B., Surgeon, the P. W. O. Grenadiers, N. I., Belgaum, proposed by Capt. J. Waterhouse, seconded by Mr. H. Blochmann.

J. C. Reeves, Esq., Assistant Engineer, P. W. D., proposed by Mr. E. W. Oates, seconded by Mr. J. Wood-Mason.

Bábu Máharáchandra Vára, Pleader, High Court, Pingála, Mid-nipur, proposed by Bábu Pratápachandra Ghosla, seconded by Mr. H. Blochmann.

Dr. J. F. P. McConnell has intimated his desire to withdraw from the Society.

Mr. BLOCHMANN exhibited an impression taken by General Cunningham from a rupee struck by Muhammad 'Adil Sháh. He said—

General Cunningham has sent me an impression of a complete rupee (new variety) struck by Muhammad 'Adil Sháh, or 'Adli, as he is often called, which adds a little to our knowledge of the history of that period.

The rupee is of the same size as the Islám Sháhí Rupee, published by Mr. Thomas in his 'Chronicles,' p. 411 and Pl. V, 190. The obverse is in fact identical.

OBVERSE—*Square area*, لا اله الا الله محمد رسول الله

Margin, مبادر الصدوق عمر الفاروق عثمان العفان علي المرتضي

REVERSE—*Margin*, ۹۶۱ * مبارز الدنيا والدين ابو المظفر سحر

Square Area, سلطان محمد بن خلد الله ملكه و سلطانه و

علي لمرمه مبادر

The full name of Muhammad 'Adil Sháh, therefore, is Mubáriz-uddín Abul-Muzaffar Muhammad 'Adil Sháh. The *julús* name was, no doubt, suggested by his real name, 'Mubáriz Khán'.

Regarding the year 961 and the 'Seal of Solomon' after the word सहर in the margin, vide J. A. S. B., 1875, Pt. I, p. 298.

Mr. W. T. BLANFORD exhibited a collection of pottery and various implements of stone, including flint knives, together with agate beads, copper ornaments, coins, &c. found by Major E. Mockler, Political Agent at Gwádar, amongst the ruins of dwelling places and tombs in various parts of Makrán (Balúchistán). Mr. Blanford said—

It is nearly a year since I had the pleasure of announcing to the Society* some of the results of Major Mockler's researches amongst the ruins of tombs and other buildings in Makrán. I then exhibited some drawings of these ancient remains and of the articles found in them. A fuller account has since been published in the Journal of the Royal Asiatic Society. I have now the pleasure of exhibiting not only the original collection made by Major Mockler at Sutkágen Dor, Dámba Koh and some other places, but several additions to his former discoveries.

Amongst the specimens on the table from Sutkágen Dor, 40 miles northwest of Gwádar, are some very well shaped flint knives, precisely such as we might expect to have been split off from such cores as those from Sakhar on the Indus, which I exhibited in 1875,† and which are now in the Geological Museum. These knives were found together with several articles of pottery (apparently made on a wheel,) one of the best of which is a vessel resembling a drinking cup, (Pl. II, fig. 1) whilst some are extremely small, about an inch in diameter, and are considered by Major Mockler children's toys. They might perhaps have been intended to hold offerings to minor deities. Other articles found at Sutkágen Dor comprise cubes like dice cut in stone, stone and pottery beads, spheres of burnt clay resembling marbles and a few fragments of copper ornaments.

The next series of specimens are from Dámba Koh, 40 miles west of Sutkágen Dor. From this place and from other localities in the neighbourhood several very beautifully shaped articles of pottery, evidently intended for holding water, were procured by Major Mockler. These vessels have as a rule small orifices and well formed spouts; sometimes there is a second orifice. Some of the water pots are ornamented with lines and bands, and some small round vessels (fig. 2) have perforated projections at the side, evidently for the purpose of string being attached by which the pots may be suspended. Another very small vessel about five inches long has the form of an amphora (fig. 3). Besides the pottery, copper bracelets (fig. 5), a small copper lamp or ladle (fig. 6), carnelian beads, and stones for sharpening knives are exhibited, all procured from the *dímbs* or tombs of Dámba Koh, Júní and Gáti.

These form the first series of specimens sent by Major Mockler, and I had intended to exhibit them in April last. I have since received another

* Proceedings for August, 1876, p. 172.

† Proceedings for July, 1875, p. 134.

valuable and interesting collection also exhibited, concerning which I will read a few extracts from a letter of Major Mockler's, dated 20th April, 1877.

"I am now sending you a lot of 'rubbish' picked up on my trip, which you can add to the former lot. I opened several more cairns and found some small differences in the mode of sepulture in each locality, also in the shape of the cairns. In my paper* I described the square and oval types; there is also to the westward a long type, some of the cairns being as much as 50 feet long, but never more than 5 feet in breadth; in these cairns I found for the first time pots which had been exposed to the action of the fire, so that the dead must have been supplied with cooked food. I examined some of these on the Kohistán hill, near Soorag, and in one found a silver bracelet which had been soldered by lead, and copper arrow heads (which I had found at Tank before). * * * The two stones from Chidizi I am most anxious to hear your opinion concerning, I take them to be stone hammers, used for what purpose I do not know, but possibly for breaking hard univalve shell fish. I feel sure that they have no connexion with the round grinding stones found in the towns, of which I have put in a couple of specimens. I should also be much obliged if you could find out and let me know whether the fragments of pottery from Balasar have anything like writing upon them.

"The copper coins from Sádátmand are, I am afraid, undecipherable; this place is on an almost inaccessible hill about 12 miles from Jashk where there are some very beautiful little cave temples hewn out of the solid rock, pillars, some square, some octagonal, &c., being left at intervals. On some of these pillars there are numerous inscriptions in the Hindi character; they are probably Buddhist."

Major Mockler adds copies of some of the inscriptions, which copies I have submitted to Dr. Rájendralála Mitra, who has with his usual kindness endeavoured to decipher them, but without complete success. One inscription he has been able to read, it runs *ráhadagana chaitá* (the grave of Ráhadagana), but of the others only portions are intelligible. Dr. Rájendralála considers these inscriptions probably 800 or 900 years old.

Some of the articles recently sent appear to indicate much the same age as those from Dámá Koh, the date of which was fairly shown by the occurrence of a Greek coin, but others may be of later date. The remains from Sutkágon Dor, comprising numerous flint knives, appear to be older. Much of the pottery from Balasar and some other places is glazed, and several articles of glass, including the remains of well formed bottles, are included in the specimens from the more western localities.

The marks on the Balasar pottery (fig. 10) look like letters but may be ornament. In one case (fig. 11) they certainly appear purely ornament-

* Journ. Roy. As. Soc. 1876, IX, p. 121.

tal. The stone hammers (fig. 12) are very curious, resembling fossil vertebræ. It is difficult to suggest for what purpose they were intended. They are surrounded by a groove, which may have served simply to enable them to be grasped in the hand, or they may have been encircled by a band by which they were fastened in a handle.

All the articles mentioned in Major Mockler's letter are amongst those now exhibited, besides a large number of articles not specified. The whole will be presented to the Indian Museum, Calcutta.

The following are the articles figured in the accompanying plate.

- Fig. 1. Unglazed earthenware cup, from Sutkágen Dor : one-fifth the natural size.
- „ 2. Vase of unglazed earthenware, with perforated projections by which it could be suspended ; from Dámá Koh, found in the ruins of a house : one-fifth the natural size.
- „ 3. Peculiarly shaped vessel of unglazed earthenware, with two perforated projections for suspension ; from Dámá Koh : one-fifth natural size.
- „ 4. Oblately spheroidal vessel, flattened below, of unglazed earthenware, with a small mouth, perhaps intended for carrying water or other liquids on bullocks, asses or mules ; from Júni : one-fifth natural size.
- „ 5. Copper bracelets with snake's head ornament, from Júni : one-fifth.
- „ 6. Copper lamp or ladle, from Júni : one-fifth.
- „ 7. Amphora of green glazed earthenware, from Gáti, 6 miles from Gwádar : one-fifth.
- „ 8. Unglazed earthenware vessel with spout and a handle of twisted cord-like form, beneath the handle is a small air hole ; the vessel is unsymmetrical and differs from all the others figured in this respect ; from Gáti : one-fifth.
- „ 9. Spout of another earthenware jar : one-fifth.
- „ 10, 11. Ornamental markings on glazed pottery from Balasar : one-fifth.
- „ 12. Stone hammer from Chidízí : one-fifth.
- „ 13. Copper arrow-head from Soorag : one-fifth.
- „ 14. Small urn-shaped vessel of green glazed earthenware ; from Girdkoh near Wank : one-fifth.
- „ 15. Flint knife from Sutkágen Dor : full size.

Mr. BALL said—It might perhaps be of interest for him to mention that in a part of Balúchistán, far from the localities where the objects collected by Major Mockler were obtained, he saw a number of mounds containing fragments of ornamental pottery. These mounds were situated in the Khetrán valley near the borders of Afghánistán. The occasion was

in 1874 when, in company with Major Sandeman, he visited the Sulimán region west of Dera Gházi Khán. There was no time for any exploration of the mounds to which their attention had been drawn by the Khetráns, who seemed to regard them as being of great antiquity. Certain it is that people of that part of the country, at the present day, neither use nor manufacture any description of pottery.

The CHAIRMAN said that the thanks of the meeting were due to Major Mockler for permitting his collection of antiquities to be exhibited to the meeting. They were highly interesting both from an antiquarian and an ethnological point of view. The study of the social condition of a people from the remains of their utensils, arms, and other domestic articles was of modern date; but it was one which, in the absence of other and more direct evidence, was of great importance, and in connexion with the dwellers of the Lake-habitations of Switzerland, and other ancient people had been very largely utilised. The evidence the articles afforded were also of a character, which none could gainsay, and were thoroughly authentic. For the illustration of the history alike of art and of civilization they were of inestimable value. He was not aware of the exact date of the articles; but accepting the opinion of his learned friend Mr. Blanford, founded upon fairly reliable evidence, that the articles must be about 2000 years old, he thought the fragments of glazed pottery exhibited were particularly interesting. In Arrian's Periplus of the Erythrean Sea, mention was made of the celebrated Murrhian cups which were said to have been exported from Bairigaza, modern Broach, but were manufactured in Guzerat and its adjoining provinces; as also in Oojein. Some antiquarians supposed that the cups were made of crystal; but there was no doubt now of their having been of porcelain, and the glazed pottery on the table showed that those who could prepare such excellent glaze, would not find the manufacture of porcelain impossible for them: at least the probability lay in their favour.

The specimens of glass on the table were not particularly good; but it was said that glass was manufactured in India from a remote period of antiquity, and mention of it was met with in many ancient works. The specimens gave a tangible proof of the assertion.

Mr. WOOD-MASON exhibited specimens of new and little known insects collected by Mr. Ossian Linborg and staff in Upper Tenasserim, and read the following preliminary notes upon them:—

ORTHOPTERA.

Fam. PILASMIDÆ.

* Female perfectly apterous; the metanotum proper much longer than the medial segment. A process at the hinder extremity of the sixth ventral segment of the abdomen.

1. *PHIBALOSOMA ACANTHOPUS*, Burm.

Bacteria acanthopus, Burmeister, Handb. d. Entom., 1838, Band II, Abth. 2, S. 565, ♀.

Phibalosoma acanthopus, Westwood, Monograph of Phasmidae, 1859, p. 74, ♂ ♀.

A specimen of this species from Tenasserim has a lamellar process (not a spine, as in the type,) bilobed at the extremity, at the hinder end of the sixth ventral segment of the abdomen. It is a gigantic insect, measuring :

Total length 10 in. 1 line ; head 6 lines ; prothorax 3·75 ; mesothorax 25·5 ; metathorax 19 ; abdomen 4 in. 6·5 lines + 12·5 lines = 5 in. 7 lines ; antennæ 2 in. 3 lines ; anterior femur 2 in. 8 lines, tibia 3 in. 1 line ; intermediate femur 1 in. 11·75 lines, tibia 2 in. 0·75 lines ; posterior femur 2 in. 4·5 lines, tibia 2 in. 5 lines.

HAB. From Moolai to Moolat, Upper Tenasserim, 4000—6000 feet ♀. Singapore, ♀ (Burmeister) ; and Java ♂ ♀ (De Haan).

2. *PHIBALOSOMA ANNAMALLAYANUM*, n. sp.

♀. Very closely allied to the preceding, from which it differs in its stouter body, in its shorter and thicker legs, and in the relative proportions of the different parts of the body, particularly the meso- and metathorax.

The following are the measurements of a spirit-specimen :—

Total length 8 in. 9 lines ; head 7 lines ; mesothorax 19 ; metathorax 16 ; abdomen 3 in. 6·75 lines + 1 in. 2·5 lines = 4 in. 9·25 lines ; antennæ 2 in. ; fore femur 2 in. 2 lines, tibia 2 in. 6 lines ; intermediate femur 1 in. 8 lines, tibia 1 in. 8 lines ; posterior femur 1 in. 11 lines, tibia 2 in. 1 line.

HAB. Annamallay forests, Southern India, a single specimen preserved in spirits, obtained by Colonel R. C. Beddome ; Travancore Hills, a much mutilated dried example, presented to me by Mr. F. Day.

3. *PHIBALOSOMA VIRGEA*, Westwood.

HAB. Sibságar, Assam, etc.

* * Female with minute scale-like rudiments of organs of flight and the metanotum proper equal to the medial segment. Hinder extremity of sixth ventral segment of the abdomen unarmed.

4. *PHIBALOSOMA WESTWOODII*, W.-M.

P. Westwoodii, Wood-Mason, J. A. S. B., 1875, Vol. XLIV, p. 216, ♀.

HAB. Samag'iting, Nágá Hills, and Nazirah, Assam.

5. *PHIBALOSOMA CANTORI*, Westwood.

P. Cantori, Westwood, Monograph of Phasmidae, p. pl. XXXVII, fig. 1, ♂, XXXVIII, fig. 1, ♀.

HAB. Malacca (Dr. T. Cantor).

Obs.—The specimen figured by Westwood as the male of *P. Cantori* may turn out to be that of the preceding species, the head being similarly

furnished with two tubercles of greatly unequal size, not a trace of which is to be seen in its supposed partner.

LONCHODES GODAMA, n. sp.

Very closely allied indeed to *L. verrucifer* (from the Andamans), but differing in its more scabrous body, especially in the male, in having the head armed with a transverse curvilinear ridge of varying development instead of conical horns, in having the supra-anal plate in the female longer than the terminal dorsal abdominal segment, in its greater size, in the structure of the male forceps, etc.

A male and a female measure respectively :—

♂ Total length 4 in. 4 lines ; head 1·75 lines ; prothorax 1·75 ; mesothorax 13·25 ; metathorax 8·75 ; abdomen 20·75 + 5·5 = 21·25 ; antennæ 22·25 ; anterior femur 12·75, tibia 14 ; intermediate femur 8·75, tibia 10 ; posterior femur 10, tibia 13·25.

♀ Total length 5 in. 9·5 lines ; head 3·25 lines ; prothorax 3 ; mesothorax 16 ; metathorax 11·25 ; abdomen 2 in. 5·25 lines + 6 lines + 2·5 lines = 3 in. 1·75 lines ; antennæ 2 in. ; anterior femur 14 lines, tibia 14 ; intermediate femur 10·5 lines, tibia 10·5 ; posterior femur 12 lines, tibia 13.

HAB. Ahsown, on the Taoo Range, Upper Tenasserim, between 2000 and 6000 feet elevation,—abundant.

Obs.—In one specimen of the female the curvilinear ridge between the eyes is enormously developed and the supra-anal plate semioval as in *L. verrucifer* which latter difference seems to be the result of injury received during immaturity.

LONCHODES PORUS, Westwood.

L. porus, Westwood, Monograph of Phasmidae, 1869, p. 42, pl. VII, fig. 9, ♂.

The female is very similar to those of *L. Bootanicus* and *L. (olim Bacteria) Baucis* (confer Wood-Mason in J. A. S. B., 1875, p. 217). The four whitish bodies described by Westwood (with probably nothing but a dried specimen for observation) as metathoracic and mesothoracic tubercles turn out to be very minute rudiments of tegmina and wings, which are represented in the female by small yellow blotches only. Similarly, the tubercles faithfully represented by Westwood in his figure, but not mentioned by him in his description of *Lonchodes virgea*, are rudiments of organs of flight ; this species should be removed from the genus *Lonchodes* to its proper place next to *Phib. acanthopus*.

HAB. *L. porus* occurs abundantly throughout the valley of the Houn-g-da-rau, Upper Tenasserim ; many individuals of both sexes in all stages of development having been sent up by Mr. Limborg.

The species forms with *Lopaphus Iolas*, *Lonchodes Baucis*, and *Lonchodes Bootanicus*, a series of most closely allied forms showing in a most instructive and conclusive manner the utter valuelessness of the presence or absence of wings as a generic character in this family of orthopterous insects.

BACILLUS HISPIDULUS, var.

Bacillus hispidulus, Wood-Mason, J. A. S. B., 1873, Vol. XLII, p. 47, pl. VII, fig. 2 et 3 ♂ ♀.

Longer and slenderer and with much longer legs than the type specimens from the Andamans. The specimen mentioned on page 48, *loc. supra cit.*, agrees with the males and was probably also from the neighbourhood of Moulmein.

HAB. Abundant throughout the valley of the Houg-da-rau.

Obs.—*B. hispidulus* ♂ is very nearly allied to *B. Souchongia*, Westw., but differs in not having the posterior angles of the penultimate dorsal abdominal segment acuminate, in its feebly forecipated anal cerci, etc.

LEPIDOPTERA.

Fam. MORPHIDÆ.

THAUMANTIS LOUISA, n. sp.

Th. alis supra albis, anticis dimidio basali, posticis partibus duabus basalibus latissime et purissime fulvis; singulis, ut in Th. Howqua, fasciâ submarginali lunularum cum maculis hastatiformibus coalitarum saturatissime violacco-fusca, ornatis; lunulis maculisque alarum posticarum valdè majoribus: alis infra luteo-fulvis, anticarum parte media sola alba luteo vix tincta; strigis quatuor sinuatis, duabus basalibus saturate brunneis, alterisque duabus submarginalibus obsoletis et tantum ad angulum analem brunneo-coloratis; anticarum ocellis omnibus (5) obsoletis, posticarum autem duobus (intermediis tribus obsoletis) rufis pupilla alba, iride tenui nigra.

Expans. alarum antic. unc. 5 lin. 3.

Habitat in Tenasserim in montibus "Tuoo" dictis ad alt. 3—6000 ped. O. Limborg detexit.

This fine and distinct species belongs to the same division of the genus as *Th. Camadeva*, *Th. Nourmahal*, *Th. Cambodia*, and *Th. Howqua*, to the last of which it is most nearly related, but from which it differs in having the upper surface of the wings white and fulvous instead of fulvous throughout, and in having five spots instead of ocelli on the under-surface of the fore wings and only two well-developed ocelli on the hinder wings, instead of three and five respectively.

Dr. RÁJENDRALÁLA MITRA exhibited to the meeting plaster casts of the celebrated Hátbigumphá inscription at Udayngiri, and submitted a revised reading and translation of that record. He said, he was indebted to his friend Mr. H. H. Locke of the Calcutta School of Art for the opportunity of reading the record and of exhibiting the casts, which had been prepared under the immediate superintendence of Mr. Locke, at the cost of

General Cunningham, to whom they belonged. They were the most perfect specimens of the kind of work that, under the peculiar circumstances of the case, could be expected. The inscription included seventeen lines of the most ancient Pāli character, and, in language, was closely allied to the edicts of Aśoka. It was recorded on the living rock above the entrance of a large natural cavern extended by art, and covered an area of over 84 square feet; each letter measuring about two inches in length. The entrance was from 5 to 10 feet high, and the monument was recorded on the highest point. The rock was of soft sandstone, and the surface on which the inscription was engraved had suffered greatly from exposure to the weather for the last two thousand two hundred years. The surface was very rough, and in many places had peeled off, causing serious lacunæ in the record. The only access to the record could be had by putting up a scaffolding, and even then the moss on its surface caused serious difficulty in the way of reading it. The surface was so uneven that no estampages could be taken that would be worth the trouble.

The record was first brought to the notice of antiquarians by Mr. Stirling in his essay on Orissa, published in Volume XV of the *Researches*, but so little was known of the ancient Pāli alphabet at the time, that nothing could be made of it. In 1837, Major, (then Lieutenant,) Kittoe, when travelling in search of coal in Orissa, came to the place, and, after great trouble, secured an eye-copy, and from it Prinsep prepared his reading and translation. Speaking of the eye-copy Mr. Prinsep said, "Nothing short of an impression (and from the nature of the rock, an impression was impossible,) could surpass in fidelity Mr. Kittoe's twice compared facsimile," and the praise was well deserved. After a careful comparison of his copy with the cast, Dr. Mitra had found very little in it to take exception to, except in places where the faintness of the engraving or the defective form of the letters had left room for alternative readings. The record had, since Lieutenant Kittoe's time, suffered extensive injury, and many letters, at times eight or ten in one place, which, judging from his facsimile, had been then perfectly clear, were no longer legible.

When Dr. Mitra was at Udayagiri he caused a cast to be taken in plaster of Paris, but by a stupid blunder his assistants forgot to number the different pieces, and so it proved utterly useless. Mr. Locke's cast had been first taken in clay, and from that reversed facsimile casts were made in plaster of Paris. The sections were so taken as to have the last letter of the first section repeated in the one next to it, and the last line of each section was repeated on the section below it, so that even without numbers the sections could not be misplaced. And altogether the work was so done as to be in every way creditable to Mr. Locke's care, diligence, and thorough knowledge of the requirements of the antiquarian.

Mr. Prinsep's translation had been prepared under many disadvantages, and, in concluding what he called his "hurried and imperfect notice," Prinsep deemed it necessary to apologize, for "offering it to the Society in so immature a shape." With the cast before him the speaker therefore thought it advisable to go over the work, and prepare an independent translation, which resulted in many changes and emendations which have materially altered the sense, and given quite a different turn to several salient points of the record, particularly in the first six lines which were in a better state of preservation than the subsequent ones.

The author of the record was one Aira, a usurper, who overthrew the dominion of an ancient king of Kalinga and, himself becoming the sovereign, repaired the city walls, built Chaityas, caused a tank to be excavated, entertained the people with feasting and music, allied himself with the king of a neighbouring hill by marrying his daughter, won over the clergy by rich presents, and had some caves excavated for their use. The most important fact mentioned in the record was the overthrow, by this usurper, of king Nanda of Magadha, and this carried him back to the middle of the fourth century before Christ. It was not distinctly stated which of the nine Nandas he overcame in battle; but assuming the potentate meant to be the last of the line, the time would be a few years before the invasion of India by Alexander the Great in 327 B. C., and make the record the oldest yet found in India. Dr. Mitra was of opinion that the caves referred to by Aira were the Queen's Palace and its surrounding caves, and the reasons on which he based this conclusion he had, he said, given at length in the forthcoming volume of his *Antiquities of Orissa*.

There were three monograms on the record. The first of these was very like the Tántric symbol called *Kurmachakra* or the "tortoise symbol." The second looked like a lamp post, but Dr. Mitra took it for the "bo tree" with a railing round its base. The third was partly like *Svastika* and partly the *Nandácarta*, the emblem of the twenty-third Jain, Ara. It was avowedly a Jain emblem; but the Buddhists looked upon it with great veneration, and many of their ancient princes adopted it for the legend of their seals, and impressed it on their coins. In the Tantras of the Hindus it was highly extolled for its mystic virtues. Nor was it confined to India alone, for in its simple form it occurred, according to King's Gnostics, on the oldest Greek coins, on Etruscan vases, on the Newton stone, Aberdeen, on Celtic monuments, and in ecclesiastical sculptures, styled there the Tetragrammaton. Similarly, the Ibis worshippers of Egypt marked with it the sacred vases of their goddess before using them at their rites. It occurred further among the Gnostics; and the Free-Masons had adopted it as one of their mystic symbols. It was the same with the mark recommended to be placed on the forehead of the elect, in Ezekiel, and on the

worshippers of the Persian Mitra. It was likewise a mark placed among the Greeks on the culprits reprieved from death, and affixed on the roll-call of Roman legions against the names of the living. It was the same with the Grammadera, first seen in Greek and Italian pottery (B. C. 700 to 500). In Schliemann's Troy there were several drawings which showed the symbol to have been common enough among the Trojans. It had been also met with on Scandinavian gold ornaments of the Bronze period. A modification of it was the distinctive badge of *Xaca Japonicus*, and the *crux ansata* and the *sistrum* were allied to it. Persons were not wanting who fancied the European coronation orb to be closely related to this mystic cross. Dr. Inman took it to be a Phallic symbol, and Max Müller thought it to be the monogram of man. That it was intimately connected with the pre-Christian cross, none who had studied the history of ancient symbols would for a moment deny.

The following is a copy of his revised translation.

Line 1. Salutation to those who have overcome all human passions *i. e.*, Arhats ; salutation to all who have attained perfection.

By Aira, the great king, who has a mighty elephant for his vehicle, who has lavished his wealth in erecting Chaityas, who is distinguished by the attributes of Sákya, who is renowned for having looted the earth to its outermost limits, who is the sovereign of Kalinga, has this hill been excavated.

Line 2. Having devoted fifteen years to juvenile pastimes, and nine years to the acquisition of (different) forms of writing, arithmetic, civil polity and laws, he, (Aira) wishing to be a king, with a giant's vigour and an endless army, becoming victorious in the third

Line 3. Battle in the capital of the Royal dynasty of Kalinga, receives royal unction.

Devoted to the duty of kings he causes the gates, walls and houses (of the city ? or of the palace ?) which had been destroyed by the rain and wind, to be repaired.

In the city of Kalinga, a lake (with water) refreshing as the moon-beam and a ghat and many roads for all kinds of equipages, he causes to be

Line 4. Consecrated. He causes the gratification of hundreds of thousands of his subjects whose heads are bent down in salutation.

In the second year (of his reign), reflecting on his interest, he causes to be placed on the west side (strong detachments of) horses, elephants men, war-chariots, and pike-bearers.

For (the gratification of) those who came from Kañsa forest to behold (the rejoicings) as also for that of the inhabitants of the town of Tánasiko, on the following year,

Line 5. He causes to be celebrated an entertainment with the music

of *ḍampana*, *tabbata* and other musical instruments by persons proficient in the science of music, and a dramatic performance by dancing girls.

Next, in the fourth year, in the house of the learned (he calls together ?) the *Arhats* who had been established by the king of the city of Eastern Kalinga. Impelled by devotion to acts of religion the forsaken umbrellas—a hundred

Line 6. Urns full of jewels, which inimical kings had given up to him, he causes to be offered (to the gods ?).

Now in the fifth year, king Nanda having been by him expelled from home, went away on a swift horse to the city of *Punádi*—

Line 7. He munificently distributes in charity many hundred thousand (*panas*)—a hundred—town, territory—governs well. In the eighth year—his mind—hill—

Line 8. (To) the prince who caused (its) destruction he ordains the pain of the cavern (imprisons in one of the caves ?) and causes the murderer to labour by a generous requital. Seated on the hill,—lavishes bland speeches and (receives ?) obeisance—

Line 9. Apes, bulls, horses, elephants, buffaloes and all requisites for the furniture of the house—to induce the practice of rejecting improper persons, he further bestows (or appoints) attendants of the *baiman* caste (*Brahmana* ?)—

Line 10. The highly renowned king causes to be made the palace of fifteen victories—

Line 11. Finding no glory in the capital which had been the seat of the ancient kings, a city abounding in envy and hypocrisy, and reflecting, in the thirteenth year—the fall of heavenly forms—twelve.

Line 12. For the profuse profit of crowded congregations he established—*Magadha* kings,—well governed—since Nanda *Rájá's* —

Line 13. He distributed much gold at *Benares*,—he gives in charity innumerable and most precious jewels—

Line 14. In the thirteenth year—married the daughter of the so-called conqueror of the mountains (a hill *rájá*,)—impelled by virtue of *Arhats*—

Line 15. By him on a hundred sides—before perfected being, and crowds of people—wealth—

Line 16. He causes to be constructed subterranean chambers, caves containing a *Chaitya* temple and pillars—for congregations—king of *Ayama*—kings of *Surasena*—caves.

Line 17. For whom the happy heretics continually prays, having a lakh of equipages—the fearless sovereign of many hills by the sun-cherished the great conqueror of the ocean shore—

The following papers were read :—

1. *On the Metád Rat, with a note on Golunda Elliotti.*—By W. T.

BLANFORD, F. R. S.

(Abstract.)

The genus *Gplunda* of Gray was originally proposed for two species ; *G. Elliotti*, already described in the Journal last year and *G. mettada*, (the specific name being evidently a misreading or misprint for *mettada*,) the subject of the present notice. This rat is very rare in collections, but Mr. Fairbank of Ahmednagar has, after a considerable amount of trouble, succeeded in obtaining several specimens, and an examination of these shew that the animal has none of the cranial or dental peculiarities of *Golunda Elliotti*, and that there is no reason for removing the metád from the genus *Mus*. A description and figures of the head, skull, teeth, &c., are given. Some measurements of fresh specimens of *G. Elliotti* are added, together with the synonymy of both species.

The paper will be printed in the Journal, Part II.

2. *Description of new Species of Asiatic Shrews in the Indian Museum.*—

By DR. J. ANDERSON.

This paper will be printed in the Journal, Part II.

3. *Notes on certain Mammals occurring in the Basin of the Máhanadi.*—

By V. BALL, M. A., F. G. S.

The following brief notes refer only to those species whose occurrence in the above named area has not been previously recorded, or regarding which any unpublished facts in reference to distribution have come under my notice.

It would not subserve any useful purpose at present to attempt to give a general list of the Mammal fauna, as the larger animals of wide range are well known to inhabit this part of the country and the Micro-Mammalia have only been partially collected.

TUPAIA ELLIOTTI, Waterhouse.

In the Proceedings for April 1874 I recorded having met with the Madras Tree-Shrew in the Sútpúra hills and also that it had been received from Monghyr. Since that time it has been recorded from Matheran by Major Hayes Lloyd and it is mentioned by Dr. Gunther as having been obtained by Capt. Beavan in Mánbhúm.

In 1876 I met with it several times in Sambalpur, not unfrequently it passed me during beats for large game, and on one occasion I picked up a dead specimen which I found early one morning lying at the foot of a tree. Save for a small quantity of blood about the mouth, this specimen shewed

no external sign of injury. On several occasions during the past season (1876-7) I have met with these small animals. They seemed to be most abundant in a large *Sal* forest on the northern boundary of Jaipur (Vizágapatam District). In Karial (Raipur District) as in Sambalpur, I found one dead early one morning last April. It had several wounds on its body which were, I think, most probably, the result of an encounter with an owl or other *raptor*. The testès were largely developed—possibly it may have been killed by another male. The measurements of this specimen were ♂ Length of body 6"5; tail 7"5 = 14".

FELIS JUBATA, Schre.

The sole evidence that I have of the occurrence of the hunting leopard is the fact that I saw a skin of one which was brought to the Sambalpur treasury for the Government reward. Unfortunately at the time I saw it it was not possible to trace the history of this skin, but it was in so good a condition that it did not seem probable to me that it had been brought by a native traveller from a long distance.

I may add that on one occasion in Rairakhol I got a brief glance at a leopard in the jungle which, from its light colour and erect carriage, I thought might possibly belong to this species.

Quite recently I have received information from Mr. F. C. Berry, C. S., of a melanoid specimen of *F. pardus* (*F. Melas*, Perron), having been shot in Sambalpur.

PTEROMYS ORAL, Tickell, *P. Petaurista*, Pallas *apud* Jerdon.

Although the brown Flying Squirrel is known to occur in the forests of Chota Nagpur and the Central Provinces I have, on account of its nocturnal habits, only once actually seen it. The occasion was one evening last April when after sunset I saw what I took to be the ordinary large red squirrel laboriously clambering up to the topmost branches of a large tree. Calling for my gun it was put into my hands just as the true nature of the animal was declared by its soaring off towards some bushes. On my shooting it the people expressed much astonishment and the Raja of Karial, near whose house I shot it, declared he had never heard of such a 'bird' before.

Karial adjoins Bastar where this species was observed by Dr. Jerdon. Mr. Blandford, I believe, obtained it near the Godávári and recently I have heard of its having been shot on Parísnáth Hill.

The colours of the Karial specimen when quite fresh were as follows :—I give them as there appears to be some difference of opinion as to the true coloration.

♂ *Above.* The hairs black, tipped with grey giving a general hoary appearance. Feet and prolonged toe which supports the parachute—black.

Tail smoky-black. *Beneath.* Greyish-white passing into smoky-grey on the cheeks extremities and edges of the parachute. This specimen does not shew the rufous patch noted by Dr. Jerdon as characteristic of the male.

Unfortunately the specimen was not measured in the flesh. After stuffing and partial drying its dimensions (unstretched) were—

Length $15''\frac{1}{2}$ + tail $15'' = 30''\frac{1}{2}$ • •

Extent between fore feet to end of claws 16"6

“ hind “ “ 17.”

Width of parachute across centre of body 12.4

SCIURUS MAXIMUS, Schre.

This squirrel probably occurs sparingly throughout the area, but in some places is particularly abundant, as in *Āthgar* near Cuttack where it is to be found in certain ancient Mango groves on the banks of the Mahanadi. I have shot it in *Rairakhol* and in *Daspalla* on the south of the Mahanadi. At *Paparhandi* in Jaipur I heard of a large colony but did not visit the locality. Dr. Jerdon found it to be abundant in *Bastar*.

ELEPHAS INDICUS, Cuv.

The elephant within our area, so far as I know, does not occur south of the Mahanadi. Possibly there may be some in the Khond Malias of the Orissa states but I have never heard of them and I received positive information that there were none in Kalahandi. Far to the south indeed, in Bastar, a party of five have for many years been wandering about, but it is stated that these, or at least a pair of them, originally escaped, and the last of the herd, a remarkably fine male, which has this year been captured by the Bastar Raja is claimed by the Jaipur Chief as having formerly belonged to him and is at the present moment the subject of a very complicated dispute. North of the Mahanadi, elephants occur in Hindol, Dhenkánál, Keonjhar and Mohurbhanj. Outside our limits they are found in the long range of hills which separates Mámbhúm from Singhbhúm.

* In the extreme west of Chota Nagpur in Korea and towards Matin and Uprora there are colonies also. In all the above localities the Keddah operations of the last ten years have much diminished the numbers—in some cases I believe no individuals of the herds have escaped.*

RHINOCEROS SONDAICUS, S. Müll.

According to Dr. Jerdon "a very few individuals (of this species) are stated to occur in the forest tract along the Mahanadi river, and extending northwards to Midnapore."

* In the Proceedings for May 1868 I have given a list of the trees upon the leaves of which the elephants of these jungles chiefly subsist.

So far as I have been able to ascertain there is no authentic case of a Rhinoceros ever having been observed in the forest region bordering the Máhanadi. It has occurred to me as possible that the rumour may have got abroad from the fact of there having formerly been tame specimens in the possession of some of the Rajas.

At Burpali in the Dakin-tir of Sambalpur the Raja told me that on the occasion of a marriage between a daughter of one of his ancestors and the Bamra Raja, the bride's dowry had been a Rhinoceros, which before that had for some years been kept at Burpali.

In Patna (Sambalpur) I met with an old Cabuli who had retired from his former business as a trader. He told me that one of his speculations was a Rhinoceros which he purchased in Calcutta and marched down offering it for sale to various Rajas *en route* till he reached Jaipur, where he disposed of it for Rs. 11,000 which sum, however, he said, he never received.

It is perhaps unnecessary to state that it is unadvisable to believe all that one hears from the people at the head quarters of these states though the lower classes of the population may be truthful enough. But I shall mention one example of an untruthful statement. A friend of mine shewed me a live specimen of a Cockatoo which he had received from one of these Rajas who assured him it had been caught in his own district. My friend, whose ornithological knowledge was limited, was expecting a further supply of the birds which the Raja promised to have captured for him during the rains when, according to their annual custom, they visited his jungles.

In conclusion I do not know of any cover or grazing grounds in the vicinity of the Máhanadi between Cuttack and Sambalpur suitable for a Rhinoceros. The bed of the river is either rocky or sandy, and marshy *jheels* occur but seldom in its neighbourhood and are then, in all cases, of small extent.

AXIS PORCINUS, Linn.

During the present year, in the Jaipur District, I saw a single specimen of the Hog-deer. I had a good view of it as, owing to its horns, being in velvet, it had come out to the edge of the jungle to feed in the day time. The species must, I think, be rare as I understood from Capt. Blaxland, the Assistant Agent, that he had never either seen or heard of it. A large collection of horns brought in by the natives did not include any of this species. In Chota Nagpur I do not know of its occurrence.

ANTILOPE CERVICAPRA, Pallas.

The Antelope is very sparingly distributed throughout this area. At Barwa in Palamow near the sources of the Sunk and Koel rivers there is a large herd and further west, in Sirguja, outside the present limits, I have met with several distinct colonies. But to the south of the Máhanadi I

only know of three localities where they exist at present. One is on the borders of Kalahandi and Ganjam where I have heard that they are somewhat abundant. The second locality is near Dulapur on the Ong river in the Dakin-tir of Sambalpur where there is a very small herd. The third locality is 150 miles further south near Omerkote on the Jaipur plateau where also the herd is but a small one. According to Colonel Tickell there were a few formerly in the open parts of Singhbhām. These have now, I believe, been wholly exterminated.

Gazella Bennettii does not occur so, far as I know, in this area, but I have seen it in the extreme west of Sirgúja, whence probably it extends steadily to the Sātpuras where it is not uncommon.

Mr. W. T. BLANFORD said, that he had heard the same explanation as that furnished by Mr. Ball for the asserted occurrence of rhinoceros wild in the Máhanadi country, and he agreed with Mr. Ball in believing that no wild rhinoceros had been found in that part of India in recent times.

LIBRARY.

The following additions have been made to the Library since the Meeting held in June last.

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No. 64. Prof. Tyndall.—On the Optical condition of the Atmosphere, in its bearings on Putrefaction and Infection. Prof. Huxley.—On the Border Territory between the Animal and the Vegetable kingdoms. W. H. Preece.—On the Applications of Electricity to the Protection of Life on Railways.

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No. 2. Michell.—The Russian Expedition to the Alai and Pamir in 1876.

No. 3. Clarke.—Report on the Congress of Orientalists (3rd Session) at St. Petersburg. Neumann.—The Tchoukot Expedition in 1868. Clarke.—Abstract of M. N. Tchirikoff's Account of a voyage to Uzbekistan in 1871-72.

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No. 177. G. J. Romanes.—Further Observations on the Locomotive system of Medusa. B. T. Lowe.—On some Phenomena connected with Vision. G. F. Dowdeswell.—Note on the changes of the fixed Corpuscles of the Cornea in the process of Inflammation. J. Tyndall.—Preliminary Note on the Development of Organisms in Organic Infusions.

No. 178. J. A. Brown.—On the Mean Directions and Distributions of the lines of equal Barometric Pressure, and their relations to the mean direction and Force of the Wind over the British Isles, &c. C. Chambers.—The Meteorology of the Bombay Presidency. R. H. M. Bosanquet.—On the Hindu Division of the Octave, with some additions to the Theory of the Higher Orders. E. Frankland.—On the Transport of Solid and Liquid Particles in Sewer Gases. W. Spottiswoode.—On Stratified Discharges. III. On a Rapid Contact-breaker, and the Phenomena of the Flow.

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H. K. W. ARNOLD, ESQ.

Annual Report of the School of Mines, Ballarat for 1875-76.

THE REGISTRAR.

Report of the British Indian Association for 1876.

THE SECRETARY.

Chart of False Point Anchorage, surveyed by navigating Lieut. G. C. Hammond, R. N., assisted by navigating Sub-Lieut. E. W. Petley, R. N., 1875-76.

Chart of False Point to Mutlah River, showing the approaches to the Sandheads from the latest Govt. Surveys. Compiled by R. C. Carrington, Supdt. Drawing Branch, Marine Survey Department.

Chart of Karachi to Vingorla, compiled from the Surveys of Commanders R. Ethersey, A. Grieve, W. B. Selby and C. G. Constable; Lieutenants A. D. Taylor, C. Y. Ward, R. W. Wish, A. W. Stiffe and R. Williams, I. N., 1835 to 1862 under the direction of Commander A. Dundas Taylor, Supdt. Marine Surveys, by R. C. Carrington, Supdt. Drawing Branch.

Chart of Goa and Marmagao Roadsteads, principally from an examination by Commander A. Dundas Taylor, Supdt. Marine Surveys, with additions from the Surveys of Lieut. J. Garling, Capt. D. Inverarity, and Commander C. W. Montriou, I. N., compiled by R. C. Carrington, Supdt. Drawing Branch.

Chart of Vingorla to Cape Comorin, compiled from the latest Govt. Surveys, by R. C. Carrington, Supdt. Drawing Branch.

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No. 112. *J. A. Harvie Brown*.—On the Distribution of Birds in North Russia, 1. On the distribution of Birds on the lower Petchora in north-east Russia. *E. A. Smith*.—Description of a new Form of *Ophiuridae* from New Zealand. *J. Wood-Mason*.—The *Vates Ashmoleanus* of Westwood, the type of a new Genus of *Mantidae*. *H. N. Moseley*.—Hermaphroditism in the Parasitic Isopoda. Further remarks on Mr. Bullar's papers on the above subject. *A. G. Butler*.—Descriptions of three Homopterous Insects in the Collection of the British Museum. *J. G. Jeffreys*.—New and peculiar Mollusca of the *Eulimidae* and other families of Gastropoda, as well as of the Pteropoda, procured in the "Valorous" Expedition. *Dr. G. C. Wallich*.—Observations on the *Coccosphere*. *M. Bavay*.—On *Anguillula intestinalis*, a new Nematode Worm found by Dr. Normand in subjects attacked by Diarrhoea of Cochinchina. *O. Galeb* and *P. Pourquier*.—On *Filaria hematica*. *M. H. Fol*.—On the Intimate Phenomena of Fecundation. *R. E. C. Stearns*.—On the Vitality of certain Land Mollusks.

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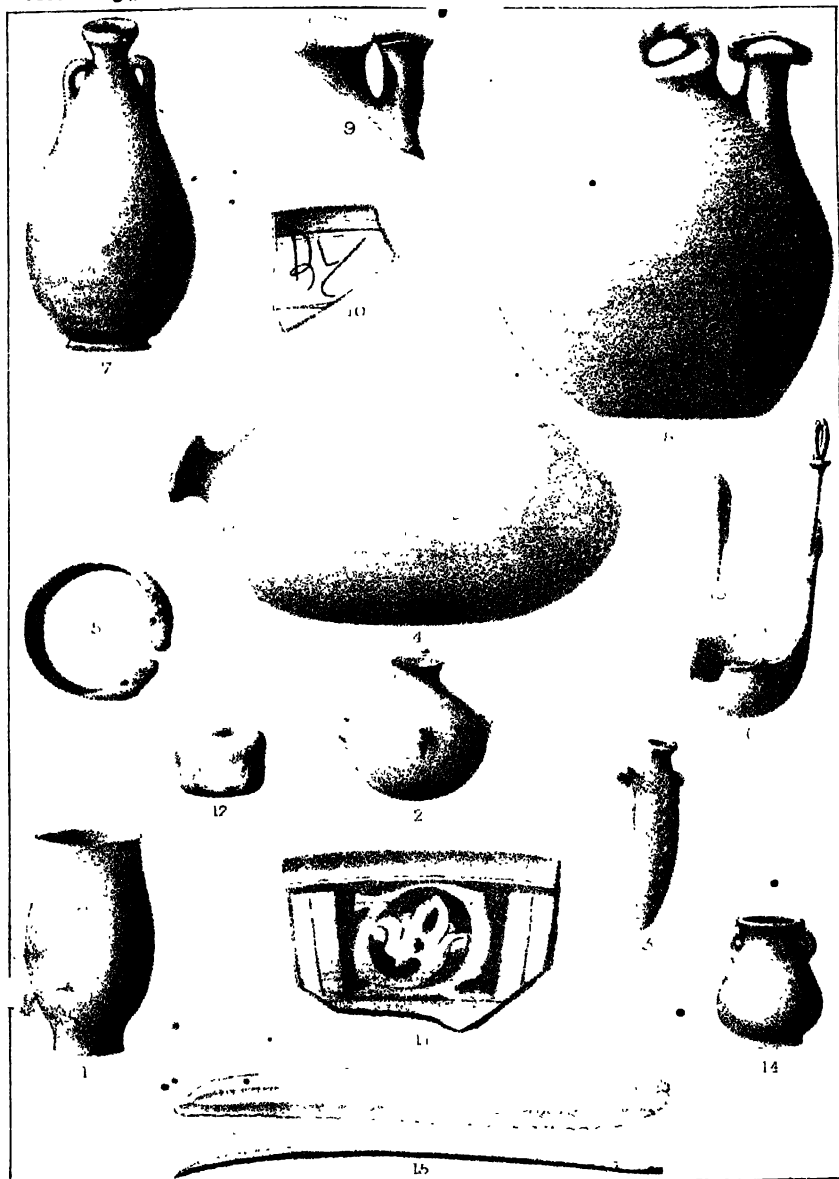
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ANCIENT POTTERY, &c., FROM BALUCHISTAN.

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR AUGUST, 1877.

The Monthly General Meeting of the Asiatic Society was held on Wednesday, the 1st August, 1877, at 9 o'clock P. M.

RAI RÁJENDRATÁLA MITRA, BAHÁDÚR, LL. D., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced :—

1. From the Author, a copy of his Report on the preparations for, and observations of, the Transit of Venus, as seen at Roorkee and Lahore, on December 8th, 1874. By Colonel J. F. Tennant, R. E., F. R. S.

2. From the Author, a copy of his work, The Lord's Prayer translated into the Bôjingijida; or South Andaman (Etákâbêada) Language, by E. H. Man.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected ordinary Members—

Dr. S. T. Peters.

J. C. Reeves, Esq.

Bábu Mahara Chandra Vrata.

The following are candidates for ballot at the next Meeting—

Bábu Pratápanaráyana Siñha, Deputy Magistrate, Jehánabád, proposed by Bábu Pratápachandra Ghosha, seconded by H. Blochmann, Esq.

Bábu Jnánendrachandra Ghosha, Calcutta, proposed by Bábu Pratápachandra Ghosha, seconded by H. Blochmann, Esq.

Bábu Kedaranátha Datta, proposed by Bábu Pratápachandra Ghosha, seconded by H. Blochmann, Esq.

Captain H. W. Clarke, R. E., Calcutta, proposed by Captain J. Waterhouse, seconded by H. Blochmann, Esq.

W. Duff Bruce, Esq., and Colonel A. D. Vanrenen have intimated their desire to withdraw from the Society.

The SECRETARY reported to the Meeting that Mr. J. D. Tremlett had compounded for his future subscriptions on payment of Rs. 140 after 16 years' Membership.

The CHAIRMAN read the following letter from Dr. H. Oldenburg of Berlin relating to a new edition of the *Vinayapiṭakam*, and stated that the Council had agreed to subscribe for two copies.

"I desire to lay before the Asiatic Society of Bengal the following prospectus of an edition of the *Vinayapiṭakam*.

"A chief difficulty in the investigation of the origin and early history of Indian Buddhism results from the fact, that the principal works of Buddhism have not yet been published, or are published only in short extracts and fragments. It is my opinion, that the *Vinayapiṭakam* in the Pāli recension (comprehending the five works *Pārājikam*, *Pācittiyam*, *Mahāvagga*, *Cūlavagga* and *Parivāra*) holds the first place among those works which deserve our attention from an historical point of view. The critical investigation of the life of Gautama Buddha, which has lately been undertaken by M. Senart, will then only have a firm foundation, when it is possible to compare the data of the *Mahāvagga* on the one hand and those of the *Suttas* on the other with those of the northern Buddhists, and so to follow the gradual growth of the Buddha legend. In the same manner it must be of the highest importance to compare the principles of Gautama's teaching in the form they assume in the *Suttas* with the form preserved in the *Mahāvagga*. The *Pārājikam* and the other works relating to ecclesiastical matters will be of great service in the investigation of the historical credibility of the Mahāvāṇsa and the Dīpavaṇsa chronicles. The data there given regarding the Councils and Schisms of the first centuries of Buddhism will receive support or correction from these writings; and the result of this comparison cannot fail to throw some light on the much debated question of the difference between the Northern and the Southern accounts of the councils. Finally it must be interesting to compare the legislative contents of the *Vinayapiṭakam* from Magadha with the corresponding and nearly contemporaneous data from Brahmanical sources in the literature of the Vedic Sūtras from the more westerly Āryavarta. Without doubt new conclusions will result from this comparative study, and such a study is impossible till the text of the *Vinayapiṭakam* is accessible in a published form.

"I intend to publish the *Vinayapiṭakam* giving the Pāli text in English letters without adding anything else but a selection from the various readings, which arise from the differences of the Sinhalese and the Burmese MSS.,

and an index. The Páli collections of the London and Paris libraries suffice for constituting my text. Any notes that may be deemed necessary, will be in English. The work will consist of 5 volumes of together 1900 to 2000 pages, taking as a model the size of Childer's edition of the *Mahápari-nibbánasuttam* in the Journal of the Royal Asiatic Society for Great Britain and Ireland. The printing expenses will amount to about £600. Messrs. Williams and Norgate, (Henrietta Street, London) have consented to undertake the publishing, if the greater part of this sum can be covered by subventions or subscriptions. The price of a copy will be £3. If the sufficient part of the expenses can be covered, the first volume will be published probably at the middle of next year, and the whole work will be finished after three or four years.

"I venture to appeal to the Society, which has already done so much to encourage Oriental learning, to afford me such assistance as they shall think that the present undertaking may deserve."

Dr. RÁJENDRALÁLA MITRA submitted a copy of the first part of a descriptive Catalogue of Sanskrit MSS. in the Society's Library, prepared under his superintendence and edited by him. It contained full notices of all the works on Sanskrit grammar belonging to the Society. In submitting it, he desired to call the special attention of the members to the MS. treasures of the Society. To those, he said, who were familiar with the great national libraries of Europe, the Society's Library cannot but appear poor. Instead of lacs, it comprised only from 15 to 20 thousand volumes, and almost every branch of the library was more or less deficient. The books, however, had been very carefully selected, and, in connexion with oriental studies, there was very little of real value that was not available to the members. The library, however, was particularly rich in MSS. Of Arabic works there were 1316 codices, of Persian 1549, and of Urdu 399, making a total of 3264. The collection of Páli and Burmese MSS. included nearly five hundred palm-leaf records. Of old Tibetan xylographs, which were quite as valuable and scarce as MSS., there were upwards of 2000 separate works, and the Chinese collection included nearly four hundred ancient texts. There was then a collection of 3,700 Sanskrit codices, making altogether a total, the like of which could not be had in any other public or quasi-public library in India. Some of the MSS. were very old and remarkably correct; a few were positively unique. The value of the collection was, however, as regards the members very much impaired by the absence of good catalogues. There were nominal lists, but they were extremely troublesome to consult, and even such lists did not exist of all the MSS. Attempts had been made from time to time to supply better helps, but owing to some cause or other they had to be given up. As regards the Sanskrit codices, Dr. Mitra

was glad to observe that considerable advance had been made. Notices of nearly 1200 MSS. had been prepared in Sanskrit, and, if some of those members who took an interest in the ancient classics of India, would turn their attention to the subject, and superintend the translation and publication of those notices, the work, the first part of which he had the honor to submit to the meeting, could be brought to an early completion. He was glad also to announce that he had on hand an analysis of the very valuable Sanskrit Buddhist MSS. which had been brought from Nepal by their distinguished associate Mr. B. H. Hodgson, and four forms of the work were already in type.

The following papers were read :—

1. *A theoretical deduction of the best Resistance of a Telegraph Receiving Instrument.*—By R. S. BROUGH.

The information given in the text-books regarding the proper resistance of an electro-magnetic receiving instrument to employ on any Telegraphic circuit is meagre and indefinite. The authors usually content themselves with saying that on short circuits the instruments should be wound with thick wire, while on long circuits they should be wound with fine wire.

Professor Fleeming Jenkin in his "Electricity and Magnetism", however, states that the resistance of the receiving instrument should not be more than a moderate fraction of the resistance of the whole circuit. In a foot note he adds that some authority (un-named) recommends that the resistance of the receiving instrument should be $\frac{1}{16}$ of that of the whole circuit, and remarks that this appears to be a very large value.

Mr. Schwendler in his "Testing Instructions", published under the authority of the Director General of Telegraphs in India, taking into consideration the influence of want of perfect insulation of the line wire, deduces that the resistance of the receiving instrument should be $\frac{1}{8}$ of that of the line wire.

The fact of the matter is that on comparatively short lines, and at low speeds of signalling (say 12 words per minute) the resistance of the receiving instrument is not of much importance, as deficiency of sensibility can be compensated by increased battery power, and the circuit will appear to work equally satisfactorily whether the resistance of the receiving instrument be 500 or 2500 ohms.

In such cases the general rule given in the Text Books is sufficient for practical purposes.

When we come, however, to the case of high-speed signalling,* or

* For high-speed Telegraphy, electro-magnetic receivers are being superseded by electro-chemical receivers, which are free from mechanical and magnetical inertia.

of very long and highly insulated lines, the question assumes a different phase and becomes one of great importance.

Now the best resistance for an electromagnet to be employed as a receiving instrument on any line has to be considered from two aspects, which may fitly be referred to as the "static" and the "kinetic."

Considered under the first aspect the problem is a purely statical one: it is to find the resistance of the receiving instrument, which will make its magnetic force a maximum, when a steady current is flowing from the sending to the receiving station. By a steady current is meant one which does not vary in strength with respect to time. This problem is completely solved and thoroughly understood.

It can be shewn* that the magnetic force is a maximum for

$$= \sqrt{ki} \sqrt{ki} (1 - \epsilon) - 2l \sqrt{\frac{k}{i}} + f(1 + \epsilon) - 2l \sqrt{\frac{k}{i}}$$

$$+ \sqrt{ki} (1 + \epsilon) + f(1 - \epsilon)$$

Where r = resistance of receiving instrument.

f = " " battery.

k † = " " conduction per unit of length.

i † = " " insulation " " " "

l = length .. line.

If the resistance f of the battery may be neglected,

$$= \sqrt{ki} \frac{1 - \epsilon}{1 + \epsilon} - 2l \sqrt{\frac{k}{i}}$$

= measured resistance of line with its distant end to earth.

* Blavier, *Annales Télégraphiques*, 1858, p. 234.

† Let A = measured insulation of line: distant end insulated.

And B = " " conduction, " " " " to earth.

Then $k = \frac{\sqrt{AB}}{2l} \log_e \frac{\sqrt{A} + \sqrt{B}}{\sqrt{A} - \sqrt{B}}$

And $i = \frac{AB}{k}$.

From this value of r a considerable reduction has to be made, on account of the thickness of the insulating covering of the wire in the receiving instrument, according to the formula :*

$$\frac{\text{Resistance of receiving instrument}}{\text{External resistance}} = \frac{\text{Diameter of bare wire}}{\text{Diameter of covered wire}}$$

Considered under the second aspect the problem is a kinetic one. Here the current is not assumed to be steady; but the influence of the resistance of the receiving instrument on the rapidity of the variation of the potential of the line is considered, that is to say, its influence on the speed of signalling, since signalling is simply causing the potential at the receiving end of the line to vary in some preconcerted manner. This problem has never been completely solved.

Sir William Thomson, however, has shewn that when the resistance of the receiving instrument is not very great as compared with the resistance of a perfectly insulated line, its effect is the same on the speed of signalling as if the line had been lengthened by a piece whose resistance would be equal to that of the receiving instrument.

Sir William Thomson has further shewn that the speed of signalling on any line depends on the value for that line of a certain constant, which may be called the "retardation characteristic" of the line, and the expression for which is

$$RC = k c l^2 \log_e \left(\frac{4}{3} \right)$$

where k is the resistance and c the capacity of the line per mile, and l is the length of the line in miles.

Now we see that the value of the RC increases as the square of the length of the line, and since by increasing the resistance of the receiving instrument we virtually increase the length of the line, it is perfectly obvious that if we make the resistance of the receiving instrument unduly high we may increase the value of the RC to such an extent as to impair the signalling speed of the line.

It thus becomes clear that in the case of a very *long* and *highly insulated* line the best resistance for the receiving instrument, as indicated by the result obtained by examining the problem under the first aspect only, may be so great as to retard the speed of signalling.

I shall here consider only the case of a perfectly insulated line.

Let l = the length of the line in miles

k = resistance per mile in ohms (supposed uniform)

c = capacity per mile in farads (ditto)

and r = the resistance in ohms of the receiving instrument.

* See Proceedings, Asiatic Society of Bengal, June, 1877.

Then the sensibility of the receiving instrument is :

$$M = \text{Const.} \times \frac{\sqrt{r}}{r + k l}$$

And assuming that the intercalation of the receiving instrument of resistance r in circuit has approximately the same influence on the signalling speed as increasing the length of the line by $\frac{r}{k}$ miles, we have

$$RC = \text{Const.} \times \frac{k c \left(l + \frac{r}{k} \right)^2}{\pi^2} \log_e \left(\frac{4}{3} \right)$$

Now, if it may be assumed that the efficiency of the receiving instrument varies directly as its sensibility, but inversely as its retardative influence, then we have the following expression for the efficiency, namely :

$$\begin{aligned} RE &= \text{Const.} \times \frac{\pi^2 \sqrt{r}}{k c \left(l + \frac{r}{k} \right)^2 (r + k l) \log_e \left(\frac{4}{3} \right)} \\ &= \text{Const.} \times \frac{\sqrt{r}}{(r + k l)^2} \end{aligned}$$

which is a maximum for

$$r = \frac{k l}{5}$$

that is, the resistance of the receiving instrument in the case of a perfectly insulated and uniform line should be one-fifth of the resistance of the line.*

Taking into consideration the resistance of the signalling battery, which has hitherto been neglected, the result is modified as follows.

Suppose we are given a certain number of cells (all of equal electromotive force and resistance) and arrange them so that the total resistance of the battery = f , then it may easily be shewn that the total electromotive force of the battery will be proportional to \sqrt{f}

Thus the expression for the sensibility of the receiving instrument becomes (employing the same notation as before)

$$M = \text{Const.} \times \frac{\sqrt{f r}}{f + r + k l}$$

and the expression for the retardation characteristic becomes

$$RC = \text{Const.} \times \frac{k c \left(l + \frac{f + r}{k} \right)^2}{\pi^2} \log_e \left(\frac{4}{3} \right)$$

and finally, the expression for the receiving efficiency of the instrument becomes,

* Singularly enough, this is the precise value selected, on experimental grounds, by Prof. Hughes.

$$RE = \text{Const.} \times \frac{\sqrt{fr}}{(f + r + kl)^2}$$

which has a maximum both with respect to f and to r , namely, for:—

$$\left. \begin{aligned} r &= \frac{1}{2} (f + kl) \\ f &= \frac{1}{2} (r + kl) \end{aligned} \right\}$$

These maxima conditions are simultaneously fulfilled by:—

$$r = f = \frac{1}{2} kl.$$

2. *Notes on the Mammalian Fauna of the Wardwán and Upper Ohendáb Valleys*.—By R. LYDEKKER, B. A., *Geological Survey of India*.

(Abstract.)

In this paper notes are given of several mammals inhabiting the Wardwán and Upper Chenáb valleys, south-east of Kashmir. The list is imperfect as scarcely any micro-mammalia, and no bats are mentioned. The following is a list of the species noticed, or the existence of which within the region has been ascertained: *Macacus rhesus*, *Semnopithecus schistaceus*, *Felis pardus*, *F. uncia*, *Ursus isabellinus*, *U. Tibetanus*, *Canis (vulpes) montanus*, and another large dark-coloured fox, resembling the dark variety of *O leucopus*, a weasel not identified, but possibly *Mustela kathiah*, *Arctomys Himalayanus*, *Lagomys Roylei*, *Pteromys inornatus*, *Moschus moschiferus*, *Hemitragus jemlaicus*, *Nemorhædus goral*, *Capra sibirica*, *Sus indicus*. A tiger is said to have been killed in the Wardwán valley, and *Cervus Cashmerianus* is occasionally found on the Kashmir side of the river, but it does not cross to the opposite bank.

Of the animals named, four species, viz., *Felis uncia*, *Canis montanus*, *Arctomys Himalayanus*, and *Capra sibirica* belong to the Tibetan fauna.

Mr. W. T. BLANFORD said—it was very important to have accurate lists of animals inhabiting various localities, as it was impossible to determine questions of distribution without a better knowledge of the range of species than we now possess. Such lists are peculiarly interesting when, as in the present case, they refer to a locality on the limits of two different great regions; the Wardwán and Chenáb valleys being on the confines of the Tibetan province, belonging to the Palaearctic region, and of the Himalayan province, the fauna of which is Oriental.

The large fox mentioned by Mr. Lydekker can scarcely be *V. leucopus*, which is smaller than *V. montanus*. It is more probably the large form of *montanus* found in Tibet and Turkestan, and apparently identical with *V. flavescens*, Gray.

3. *Notes of a pre-historic Burial-place with cruciform Monoliths near Mungapet in the Nizam's Dominions.*—By W. KING, Deputy Superintendent Geological Survey of India.

(Abstract.)

After details of locality, and supposition of possibly previous observation and description, the paper gives an account of an assemblage of about 150 kists encircled by stone rings, with 4 large stone monoliths in the form of crosses.

The ~~kists~~ kists and crosses are all of dressed stone, the former being of a much higher style of building than is usually seen in the other ring-surrounded kists of S. India which are commonly called Korumbar Rings.

The cruciform monoliths are distinguishable from other crosses of pre-Christian type, by the different size of the limbs, and by the curved junction between the lower limb and the arms. The largest cross is 13 feet long. One of the crosses is still standing in an upright position, with the lower limb buried about 6 feet in the ground.

The tombs consist of four upright slabs, with a covering lid: the entrance being at one side of the wall facing the sun. Inside, there is a floor slab which is hollowed out in one or more cavities or coffin-like receptacles, an arrangement which is quite different to that of the so-called Korumbar rings which usually contain urns either for the bodies in a packed position, or ashes.

The author supposes that in the present example, the bodies were embalmed.

The principal tomb is 9' 6" long by 9' wide, with a covering slab, 14' 8" by 11' 6," and 1' 4" thick at the edge; the whole height being 5 feet. It contains two coffin-like receptacles, with room for a third. The circle of stones enclosing this tomb is 37 feet in diameter.

The several parts of the tombs are each of one stone.

The stone used is that of the locality, a sandstone; and in this the present tombs differ from the ruder Korumbar rings which are usually built of stone fetched from a distance.

Other, but poorer, assemblages of tombs and without crosses, occur on the slopes of the low hills in the neighbouring country.

These relics are without any inscriptions, or incised characters.

The author supposes that this burial-place is of pre-Aryan age, or rather of the Hindo-Kolarian times. This is about the same age as Colonel Glasford (who had previously written of other megalithic remains in the neighbouring country) attributes to the relics observed by him, and which he calls Indo-Seythic.

This surmise as to the age rests on the fact that similar, though ruder, remains of the same style (the crosses excepted) occur all over the country,

and northwards into the proper country of the Kolarians who now in Chutia Nagpur still build and use tombs of a like kind; and the more improved style of the Rákshasgúrdium tombs is attributed to the highest phase in civilization of the pre-Aryan people, who possibly dwelt here and were absorbed by or amalgamated with the Aryan conquerors.

The supposition of a possibly early Christian origin is met by the non-occurrence of other traces of the cross in the outlying country.

The CHAIRMAN remarked that it was usual to associate with pre-Christian and non-Christian crosses a religious signification. Most writers took them to be mystic symbols, and Mr. Inman and others believed them to be of phallic origin. That in some cases there were religious, or mystic, ideas associated with the cross could not be denied, but he thought it would be unwarrantable to suppose that all crosses were connected with religion. Rude stone crosses of other than Christian origin were met with mostly near cairns, cromlechs and other memorials of the dead, and their object was to attract attention to the grave near which they were placed. For this purpose a rough-hewn shaft, such as could be most easily prepared, would scarcely be distinctive enough; it would be somewhat better than an amorphous one, but it would often pass quite unnoticed. An upright post with a cross bar, or, what would be the same thing, a cross-shaped block, on the other hand, though requiring no great effort of ingenuity to execute, could not fail to attract the attention of the rude primitive people for whom, and by whom, they were set up. Such a sign-post in course of time and frequent usage, would become the usual symbol for a grave. It was the simplest and at the same time the most effective, and so it got a wide currency without any religious or mystic idea being associated with it.

Mr. BALL said that on one occasion, eleven years ago, when in company with Dr. Oldham and Mr. Hughes he remembered to have seen an ancient stone cross in the Hamribágh district. The precise locality was at Basatpur near Leiyo in the valley of the Bokáro river. He regretted that he possessed no record of the character of the cross; but he had a note to the effect that there were at the same place a number of dressed, memorial stones, with a truncate-pyramidal shape, which were marked with series of graves that may possibly have had some signification. All of these, like the rude slabs which are put up in parts of Chutiá Nágpur even to the present day, were said to have been the work of Kols.

He hoped this record might be the means of having these remains revisited and properly described. At the time he saw them, he did not attach a proper degree of importance to them, though he remembered that they reminded him of some Celtic remains with which he was familiar.

Mr. W. T. BLANFORD said, he greatly regretted that when in the country to which Mr. King's notes refer, he did not take the opportunity

of visiting the very singular remains described, although he heard of them from Captain Glasfurd, Mr. Vanstavern and others. Despite the very high authority of Mr. Fergusson, he could but agree with Mr. King and the Chairman in thinking it questionable whether the crosses in the Godávári valley have any connection with Christianity. There are two circumstances which should, he thought, be taken into consideration before admitting the Christian origin of these monoliths.

The first has been already noticed by Mr. King; it is the absence of any inscription, of any distinctive sculpture, or of any Christian symbol except the cross. Now a people who were sufficiently civilized to carve and transport monoliths of this size, must, if they were Christians, have been acquainted with the art of writing, and it is inconceivable that they should not have engraved some memorial of the purpose for which the stones were erected.

The second reason is the association of the crosses with cromlechs and stone circles. In the Proceedings of the Society for 1868, besides Mr. Mulheran's description of the crosses and cromlechs on the Godávári, at pp. 116 and 148, there are several notices of cromlechs or kistvaens in Coorg and other parts of India, pp. 151, 184, 243. But no one appears to have called attention to the very remarkable explorations of kistvaens and stone circles in the Southern Marátha country by Captain Meadows Taylor. The details of these explorations were published in the Journal of the Bombay Branch of the Royal Asiatic Society in two papers, one entitled "Ancient Remains at the village of Jimarji near Ferozabad on the Bhima," (Vol. III, Pt. 2, p. 179); the other, "Notices of Cromlechs, Cairns and other ancient Seytho-Druidical remains in the principality of Sorapur," (Vol. IV, p. 380.) In some of the circles stone kists were found containing human skeletons, and, together with the perfect skeletons, were skulls detached from the bodies to which they had belonged, in a manner which appeared to prove that human victims had been sacrificed at the funerals of chiefs. In the kistvaens were found urns with bones which had been subjected to the action of fire.

Now it is not likely that any Christian people either sacrificed slaves or concubines at the tombs of their Chiefs, or that they burned bodies. Is it probable that, after they became Christian, they would so far have preserved their former funeral rites as to bury their dead in cromlechs, or to mark their graves with stone circles? It is of course possible that the crosses may be of later date than the cromlechs, but all observers appear to think the contrary.

4. *Note on two Copper-plate Grants of the Chandel Dynasty of the eleventh and twelfth centuries of the Samvat Era.*—By PANDIT PRÁNNÁTH SARÁSWATI, M.A., B.L.

(Abstract.)

These two copper-plate grants are of the *Chandel* dynasty, dated Samvat 1055 and 1107, corresponding to the years 998 and 1050 of the Christian era. The Society was indebted for these copper-plates to V. A. Smith, Esq., B. A., B. C. S., who sent the following account of their discovery :

“ In 1872 a peasant when ploughing in the lands of Mauza Nanyaurá, Parganá Panwári, Zila Hamírpúr turned up two inscribed copper-plates. The plates were brought to Mr. W. Martin, C. S., who is now on furlough, and were left by him in the hands of a local pundit [Muralidhar of Maudahá, in Hamírpur Zilá] who was in his service. With the assistance of this man I have had Nágrí transcripts prepared, and have made translations of the inscriptions.” The first of these, records the grant of certain lands by Sri Dhanga Deva, the Lord of Kálinjara, the son of Yasovarmma and the grandson of Sri Harsha ; the recipient of this gift (which was made at Benares on the occasion of an eclipse of the Moon) is mentioned as one Rudra Sri Yasodhara, son of Rudra Jaya Kumára, belonging to the *gôtra* of Bháradvája, the *pravara* of Bháradvája Angirasa and Vrihaspati, a follower of the Vájasaneyá *sákhá* of the Yajurveda and an inhabitant of the village नकायिका Tarkáyiká.

The second copper-plate records the grant of certain other lands by Deva Varmma Deva, the Lord of Kálinjara, the son of Vijaya Pála Deva and the grandson of Vidyádhara Deva ; the recipient of the gift (which was made on the occasion of the annual *shradh* of the donor's mother, the Queen *Bhuvana Deví*) is mentioned as a Brahman by name Abhimanyu, the son of Bhatta Ellá, the grandson of Jayavara, belonging to the *gôtra* of Bháradvája, the *pravara* of Angirasa Vrihaspati and Bháradvája, a follower of the Yajur Veda *sákhá* and an inhabitant of *Takári bhatta gráma* which may be translated to mean the village of *Takári* inhabited by *Bhattas*, i. e. Brahmans learned in the Vedas. Deva Varmma's name is new, not being mentioned, in any of the previously discovered inscriptions or copper-plates, or the annals mentioned in Major-General Cunningham's *Archæological Survey of India*, Vol. II. The name of the Queen-Mother *Bhuvana Deví* is also new.

Mr. Smith had forwarded transcript and translations of the inscriptions on the copper-plates which I have revised. They will be published, with a detailed Note, in the Society's Journal.

The Pandit then spoke to the following effect :

This concludes the announced programme of the meeting, but before I

resume my seat I hope to be permitted to speak a few words about the agreeable surprise which the Chairman had provided for us. Dr. Rájendralála has laid the Society under many obligations, but his latest labour of love is as valuable as any that preceded it. The work of cataloguing MSS. is no doubt very trying and in the main uninteresting, but the very absence of attractions ought to make us grateful to those who undertake the necessary task. In the midst of an increasing load of years and anxieties, and a multiplicity of avocations and pursuits, the learned Doctor has given an example of perseverance and assiduity which men younger in years would do well to imitate. The author's name was a sufficient guarantee of the value of the work, and I beg to propose that—

The best thanks of the meeting be tendered to Dr. Rájendralála Mitra for the labour of love which he has performed in bringing out the first fasciculus of an improved Catalogue of the Society's Sanskrit MSS.

The motion was seconded by Mr. W. T. Blanford and carried unanimously.

Note on the Floral simulation of *Gongylus gongylodes*, Linn.—By DR. J. ANDERSON, Superintendent Indian Museum, Calcutta.

DR. ANDERSON said, that he was indebted to Mr. C. T. Buckland for the opportunity to exhibit some living examples of a very remarkable form of Orthopterous insect. Three of the insects were alike and were probably the females of a fourth insect which, however, differed from them considerably in size and colour, as well as in the absence, or merely rudimentary development of certain leaf-like appendages which are a striking feature in the larger insects. Dr. Anderson expressed regret that, owing to the temporary absence from Calcutta of Mr. Wood-Mason, he was deprived of the special knowledge which Mr. Mason possesses regarding the Orthoptera, as he would possibly have been able to say if all the insects belonged to one species, *i. e.* whether the small brown insect is the male of the larger and green coloured individuals.

These insects, however, all came from the same locality, having been forwarded to Mr. Buckland by Mr. Larymore of the Central Jail at Midnapur. Mr. Larymore had procured them from the neighbouring country district where Santál women and children had hunted them out and brought them in, hanging on branches or twigs of a bush, somewhat like a wild plum tree. They are also said to be found upon rose bushes, and in connection with this it was observed that, in Midnapur, they were known as rose-leaf insects from the circumstance that when the insect is more developed and furnished with wings, the foliaceous appendages are said greatly to increase in size and exactly to resemble rose leaves. Dr. Anderson, however, was disposed to think that more than one species might probably occur in

the Midnapur district, and that these insects with the larger foliaceous expansions might be distinct from the species now before the Society.

Mr. Buckland had made over these insects to Dr. Anderson, and since that time they have been regularly fed upon house-flies and grasshoppers; the latter, however, appear to be rather too strong for them and they therefore prefer the flies. They have been tried with small fragments of plantain and custard-apple which they not only eat, but the juice of which they seem to suck with considerable avidity. Dr. Anderson, however, thought that it was the moisture of these fruits that was the chief attraction to these insects, for the entire character of their organization indicated a rap-torial habit.

Dr. Anderson went on to say that he had succeeded in identifying the three, larger insects by means of a single dried specimen in the Indian Museum which, however, was fully mature and provided with wings. These remarkable insects proved to be the pupæ of a peculiar species of Mantis which was known to Aldrovandus* who figured it more than a century and a half before the first appearance of the *Systema Nat.* of Linnæus to whom it was known as *Gryllus gongylodes*† and also as *Mantis gongylodes*‡ and since the time of Aldrovandus it had been figured in a variety of works on Natural History, but apparently in every instance from mature, and seemingly from dried specimens, so that the colours of the insect during life had never been correctly described.

So much by way of introduction to these remarkable pupal Mantises, the recognized scientific name of which is *Gongylus gongylodes*, Linn.

The reason which induced Dr. Anderson to bring them to the notice of the Society had now to be pointed out. On looking at the insects from above, they did not exhibit any very striking features beyond the leaf-like expansion of the prothorax and the foliaceous appendages to the limbs, both of which, like the upper surface of the insect, are coloured green, but on turning to the under surface the aspect is entirely different. The leaf-like expansion of the prothorax, instead of being green, is a clear, pale lavender-violet with a faint, pink bloom along the edges of the leaf, so that this portion of the insect has the exact appearance of the corolla of a plant, a floral simulation which is perfected by the presence of a dark, blackish brown spot in its centre, over the prothorax, and which mimics the opening to the tube of a corolla. A favourite position of this insect is to hang head downwards among a mass of green foliage, and, when it does so, it generally remains almost motionless, but, at intervals, evinces a swaying movement as of a flower touched by a gentle breeze, and while in this attitude, with its

* Ins. tb. 13, fig. 21 (1602); edit. Francft. b. 7, fig. 2, 3 infra (1623).

† Linn. Mus. Ludow. Ulr. 112, 3: Linn. Syst. Nat. H. 1767, 690.

‡ Stoll Spectr. et Mant. fig. 58, 59 ♀; Oliv. Encycl. Ins. VII, 626, 7; fig. 3-5 ♀.

fore limbs, banded violet and black, and drawn up in front of the centre of the corolla, the simulation of a papilionaceous flower is complete. The object of the bright colouring of the under surface of the prothoracic expansion is evident, its purpose being to act as a decoy to insects, which, mistaking it for a corolla, fly directly into the expectant, serrated, sabre-like, raptorial arms of the simulator. It is no new fact that many insects resemble the leaves of plants and trees, and that they manifest forms and colours which serve to protect them in the struggle for existence, but, as far as Dr. Anderson had ascertained, this was the first recorded instance of an insect simulating the corolla of a flower for the evident purpose of attracting insects towards it for its sustenance. It is even more remarkable than this, for it is a localized adaptation for such a purpose, a portion of the insect being so modified in form and colour that the appearance of the corolla of a plant is produced, in conjunction with the remainder of the long attenuated prothorax, which, at a distance, resembles the flower-stem: the anterior limbs when in repose even adding to and heightening the deception.

Mr. W. T. BLANFORD said he thought that the simulation of a flower by this or an allied species of *Mantis* had been noticed by Mr. S. E. Peal, who some years since sent a drawing of the animal to Mr. Wood-Mason. The facts had not, however, Mr. Blanford believed, been published, as Mr. Wood-Mason waited until he could obtain specimens.

The CHAIRMAN announced that the next meeting would be held in November, after the recess.

The following communications have been received—

1. *Three Translations from the Hamāseh*.—By C. J. LYALL, Esq. C. S.
2. *Note on Khánja Khán Garh near Salímábád, Burdwán*.—By BĀBU GOUR DĀS BAISAKH.
3. *Metrical Translations from the Quatrains of Umar Khayyám*.—By P. WHALLEY, Esq., C. S.
4. *Further Proofs of the Monogamy of Kálidása's Heroes*.—By G. S. LEONARD, Esq.



LIBRARY.

The following additions have been made to the Library since the Meeting held in July last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS,
presented by the respective Societies or Editors.

Batavia. *Natuurkundig Tydschrift voor Nederlandsch-Indië*, uitgegeven door de Koninklijke Natuurkundige Vereeniging in Nederlandsch-Indië Deelen 34—36.

Bombay. *The Indian Antiquary*,—Vol. 6, Pt. 69, 1877.

Dr. G. Bühler.—Eleven land-grants of the Chaulukyas of Anhilvad.

Calcutta. *The Māhabhārat*,—Vol. 1, No. 8, and Vol. 2, No. 9.

———. *The Rāmāyana*,—Vol. 6, No. 2.

London. *The Athenæum*,—Nos. 2590—2593, 1877.

———. *The Geographical Magazine*,—Vol. 6, No. 6, 1877.

R. Cross.—The India-Rubber Trees in Brazil.

———. *Nature*,—Vol. 16, Nos. 398—401, 1877.

Lyon. *La Société de Géographie*,—Bulletin, Tome 1, No. 7.

Paris. *La Société de Géographie*,—Bulletin, Avril 1877.

Ch. Maunoir.—Rapport sur les travaux de la Société de Géographie et sur les progrès des sciences géographiques pendant l'année 1876. *Du Treuil de Rhins*.—Note sur l'Annam. Extrait d'une lettre adressée au secrétaire général. Voyage de M. Mikloukho-Maklaï dans la presqu'île de Malaisie. Lettre au secrétaire de la Société Russe de Géographie (avec carte dans le texte).

Roorkee. *Professional Papers on Indian Engineering*,—Vol. 6, 2nd Series, No. 25.

Capt. J. L. Morant.—Mountain Railway for the Nilgiri Hills. *Capt. A. Cunningham*.—Discharge of Canals. *H. G. McKinney*.—Useful Australian Timbers.

Rome. *Reale Accademia dei Lincei*,—Atti, Vol. 1, Fas. 6, 1877.

Aruso e Brigidi.—Intorno alle alterazioni prodotte nell' organismo dall' azione dei bromuri.

Trieste. *Società Adriatica di Scienze naturali*,—Bollettino, Nro. 1, Vol. 3.

Yokohama. *Die Deutsche Gesellschaft für Natur- und Völkerkunde Ostasien*,—Mittheilungen, Heft. 12, Mai 1877.

BOOKS AND PAMPHLETS

presented by the Authors.

MAN, E. H. *The Lord's Prayer translated into the Bôjingtjida, or South Andaman (Elakabeëda) Language*. With preface, introduction and notes by Lieut. R. C. Temple. 8vo., Calcutta, 1877.

- RÁJENDRALÁLÁ MITRA, DR.** A scheme for the rendering of European Scientific Terms into the Vernaculars of India. 8vo., Calcutta, 1877.
- TENNANT, J. F., COLONEL.** Report on the Preparations for, and Observations of, the Transit of Venus, as seen at Roorkee and Lahore on December 8, 1874. 4to., Calcutta, 1877.
- THOMAS, EDWARD.** Jainism, or the early faith of Asoka. Pamphlet, 1877.
- VON MUELLER F., BARON.** Select Plants readily eligible for Industrial Culture or Naturalisation in Victoria, with indications of their Native Countries and some of their Uses. 8vo., Victoria, 1876.

MISCELLANEOUS PRESENTATIONS.

Selections from the Records of the Madras Government, No. 59: Annual Report of the Civil Dispensaries for 1875-76.

THE GOVERNMENT OF MADRAS.

A Catalogue of Sanskrit MSS. existing in Oudh, for the quarter ending 30th September, 1875.

THE GOVERNMENT OF THE N. W. PROVINCES.

Report on the working of the Government Charitable Dispensaries in the Central Provinces for 1876.

Report on the Lunatic Asylums in the Central Provinces for 1876.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

The Fifth Annual Report of the Board of Directors of the Zoological Society of Philadelphia, 1877.

THE SECRETARY,

Report on the Preparations for, and Observations of, the Transit of Venus, as seen at Roorkee and Lahore, on December 8, 1874. By Colonel J. F. Tennant, R. E.

CAPTAIN J. WATERHOUSE.

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THE ROYAL GEOGRAPHICAL SOCIETY.

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L. W. Thomé.—Zur Theorie der linearen Differentialgleichungen.

Calcutta. The Indian Medical Gazette,—Vol. 12, No. 7.

Dr. Max von Pettenkofer.—Nine Propositions bearing on the Ætiology and Prophylaxis of Cholera, deduced from the official Reports of the Cholera Epidemic in East India and North America.

Giessen. Jahresbericht über die Fortschritte der Chemie für 1875, Heft. 3.

Göttingen. Göttingische Gelehrte Anzeigen,—Stücke 22, 23, 25 and 26.

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Leipzig. Annalen der Physik und Chemie,—Ergänzung Band 8, Stück 3; Band 160, Stück 4; Neue Folge, Band 1, Heft 1—2.

Band 8, Stück 3. *A. L. Holtz*.—Ueber die Magnetisirung ellipsoidischgeformter Eisen und Stahlkörper und die Veränderung des temporären und permanenten Magnetismus. *W. Holtz*.—Einige wesentliche Verbesserungen an einfachen und zusammengesetzten Influenzmaschinen.

Band 160. Stück 4. *P. Glatzel*.—Neue Versuche über die Ausdehnung von Körpern durch die Wärme.

Band 1. Heft 2. *E. Edlund*.—Ueber die electrischen Ströme, welche bei dem Strömen der Flüssigkeiten durch Röhren entstehen. *W. Hankel*.—Ueber das magnetische Verhalten des Nickels und des Kobaltes.

———. ————. Beiblätter, Band 1, Stücke 5—6.

Stück 5. *Uchatius*.—Ueber die Erhöhung der Elasticitätsgrenze der Metalle durch dauernde Spannung.

Stück 6. *G. Pisati*.—Ueber die Elasticität der Metalle bei verschiedenen Temperaturen. *G. Pisati* and *G. Saporito-Ricca*.—Festigkeit des Eisens bei verschiedenen Temperaturen.

London. The Academy,—Nos. 265, 267—270, 1877.

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No. 917. The Jablochkoff Electric Candle.

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No. 1280. *C. W. Vincent*.—Spontaneous Combustion in Factories and Ships.

No. 1285. *A. V. Harcourt*.—The Chemistry of Gas Manufacture. Economic Plants in Jamaica.

Paris. Annales de Chimie et de Physique,—5th Série, Tome 11, Juin 1877.

C. Bernard.—Critique expérimentale sur la fonction glycogénésique du foie.

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No 23. *MM. E. Matthieu et V. Urbain*.—De l'affinité des globules sanguins pour l'acide carbonique. *M. C. M. Goulier*.—Baromètres à siphon dont les indications ne sont pas influencées par les variations de la température. *M. V. Feltz*.—Expériences démontrant qu'il n'y a pas dans le sang putréfié toxique de virus liquides ou solides en dehors des ferments organisés.

No. 24. *M. F. Perrier*.—Etude comparative des observations de jour et de nuit. *M. Gramme*.—Recherche sur l'emploi des machines magnéto-electriques à courants continus. *M. L. Périer*.—Sur les variations du diamètre des globules rouges du sang dans l'espèce humaine au point de vue de l'expertise légale.

No. 25. *P. Secchi*.—Sur l'état actuel de l'atmosphère solaire. *M. Th. du Moncel*.—Sur les électro-aimants à rondelles de fer. *M. Ch. Morel*.—Recherches sur le tétrachlorure de carbone et sur son emploi comme anesthésique.

No. 26. *M. Ch. Richet*.—De la recherche des acides libres du suc gastrique. *M. M. Raynaud*.—Sur la lymphe comme agent de propagation de l'infection vaccinale.

Paris. *Revue des Deux Mondes*,—Tome 21, Livraison 4; Tome 22, Livraison 1, 1877.

Tome 21, Liv. 4. *M. E. Burnouf*.—L'âge du bronze et les origines de la métallurgie. *M. E. Planchut*.—L'archipel des Philippines. L'industrie, le commerce, la situation politique.

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No. 52. *M. G. de Varigny*.—Les Musulmans des Indes, et la question d'orient.

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BOUCHER, R. *Divan de Férâzîdâk, récits de Mohammed Ben-Habib d'après Ibn-el-Arabi, publié sur le Manuscrit de Sainte-Sophie de Constantinople.* Pts. 3—4, 4to., Paris, 1875.

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PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR DECEMBER, 1877.

The Monthly General Meeting of the Asiatic Society of Bengal, was held on Wednesday, the 5th December, at 9 P. M.

Major-General H. L. THUILLIER, R. A., C. S. I., Vice-President, in the Chair.

The following presentations were announced :—

1. From H. Blochmann, Esq., a copy of the *Maqámát-i-Badí'-i-Hamadání*, lately lithographed at Lucknow.

2. From J. McCrady, Esq., a copy of the following papers read before the Elliot Society :

Description of the Oceanic (*Turritopsis*) *Nubricula*, N. S. and the Embryological History of a singular *Medusan* larva, found in the cavity of its belt.

Gymnophthalmata of Charleston Harbor.

3. From the Trustees of the British Museum the following books : Description of Ancient Marbles, Pts. I to XI, Catalogues of Fossil Reptilia of South Africa, British *Hymenoptera*, British Fossil Crustacea, Birds, Typical specimens of Lepidoptera Heterocera, and a Guide to the Exhibition Rooms in the Departments of Natural History and Antiquities.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected ordinary members—

Dr. Krishna Dhán Ghose.

L. Mandelli, Esq.

The following are candidates for ballot at the next meeting—

1. Lieut. H. A. Sawyer, B. S. C., Military Department, Calcutta, proposed by Captain J. Waterhouse, seconded by H. Blochmann, Esq.

2. Alexander Ward, Esq., M. R. C. S., proposed by Dr. J. M. Foster, seconded by H. Blochmann, Esq.

The CHAIRMAN announced that Dr. Wise had compounded for his subscriptions by the payment of Rs. 230, and Mr. Alex. Grant, on payment of Rs. 332.

The CHAIRMAN said—

It would be in the recollection of Members of the Society that at the Meeting in November last year the Society sanctioned a proposal of the Council for the demolition of the present boundary wall in Park Street and the erection in its place of a dwarf wall and railings, with two gateways and a durwan's lodge, at a cost of Rs. 4,469. Arrangements were accordingly made for putting the work in hand, but the Council found some difficulty in selecting any really suitable railing for the site within the cost sanctioned. Meanwhile it was ascertained that the Municipality desired to obtain a slip of the Society's ground to improve the approaches of Park Street. In this view, and as one of the principal objects of erecting a railing was to beautify the approach to Park Street, it was thought that the Municipality, on receiving the ground required, would be willing to bear part of the expense of putting up the new railings, and with their help a handsome railing could be put up at a less cost to the Society than an ordinary railing would have been.

Informal proposals made to the Chairman of the Municipality on this basis were favourably entertained by him, and the Engineer of the Corporation was instructed to prepare a design and estimate for the railing and gateways required by the Society.

On the 20th August the Secretary of the Society received a note from Mr. Metcalfe forwarding copies of a very handsome design for the railing, and stating that its estimated cost would be Rs. 9,370 of which the Municipality would pay Rs. 2,000.

As the share of the expense, amounting to Rs. 7,370, the Society was thus expected to pay, was considerably in excess of the sum sanctioned, it was represented to Mr. Metcalfe that the Society could not possibly afford so much, and it was hoped that a less expensive design could be fixed upon.

In September last, when Park Street was under repairs and arrangements had already been made by the Municipality to widen the roadway by narrowing the footpath, the Municipality were anxious to take immediate possession of the strip of land required to widen the footpath, and the Secretary to the Corporation wrote stating that the Commissioners had under consideration certain proposals for improving the entrance into Park Street from Chowringhee, and forwarded a plan showing a strip of land belonging to the Society, which the Commissioners wished to purchase. The size of the strip was estimated at 8 chittacks and its value at Rs. 255/9, at the rate of Rs. 500 per cottah, but as the Commissioners wished to have

possession of the land at once, they were willing to pay 15 per cent. on the Surveyor's valuation, or say, Rs. 300 for the strip. They further undertook to pull down the wall and purchase the rubbish for their roads, temporarily putting up a wire fencing to prevent encroachments on the grounds of the Society.

Before submitting this letter to the Council, the Secretary wrote to Mr. Turnbull, to the effect that if the Municipality wished to acquire the land and demolish the wall, they must, in addition to the value of the land, give compensation to the Society for the damage done to the wall and gateway at least equal to the cost of replacing them, roughly estimated at Rs. 1,500. This the Municipality declined to do, as they considered the terms offered very fair because the wall &c. had already been condemned.

On this correspondence being referred to the Council they resolved, in order to endeavour to settle the question which had been long pending, that they would not sell any land belonging to the Society, but if the Municipality wished to improve the site at the corner of Park Street by widening the roadway, and would replace the present boundary wall of the Society's premises by a handsome railing with two gateways and a durwan's lodge, the Council were willing to give the strip of land required to widen the roadway, together with a money payment equal to half the cost of putting up the railing, up to a limit of Rs. 3000. This proposal was communicated to Mr. Metcalfe, who said he would be unable to accept it because the Finance Committee of the Corporation would object on principle to giving money for the railings, and he proposed as an alternative—

(a.) That the Municipality remove the present wall at their own expense.

(b.) That they pay the Society for the value of the materials removed.

(c.) That the Municipality put up a seven-strand neat twisted wire fence with iron standards, properly stretched, with two gates. The work to be neatly done and painted.

These propositions were declined by the Council because they felt that if the Municipality wished to acquire ground for a public purpose, they were bound to give the Society at least the compensation to which they were entitled under the Land Acquisition Act, comprising the value of the land plus 15 per cent. and full compensation for all damage or loss caused by the demolition of the walls, especially as the object for which the Society was willing to cede a portion of its land to the town would not be gained, and the whole burden of putting up the railings would thus be thrown upon the Society.

Since this reply of the Council no further steps have been taken in the matter, nor have any communications been received from the Municipality on the subject, but the Council hope that an arrangement may soon

be come to which will result in the long-desired improvement being carried out.

The Chair was then taken by the President, the Hon. Sir E. C. BAYLEY, K. C. S. I.

Mr. R. S. BROUGH read the following note on Professor Graham Bell's Telephone—

Prof. Graham Bell's Telephone.

With the aid of the report of the admirable description of Prof. Bell's Telephone, given by Mr. W. H. Preece before the meeting of the British Association at Plymouth, and of the excellent papers recently published on the same subject in "Nature," the "Engineer," and "Engineering," we have been enabled to make up a few for experimental purposes in the Telegraph Workshops at Alipore; and, as I have no doubt many Members of the Society are anxious to make themselves practically acquainted with these most ingenious instruments, I have ventured, at the instance of the Honorary General Secretary, to place a pair before you this evening.

Before proceeding to illustrate practically the working of the Telephones, it will perhaps be generally acceptable if I give a brief preliminary explanation of their principle and construction.

I will follow Mr. Preece in recalling to mind the fact that the character of a musical note, that is of a sensible periodic sound, is determined by its condition with respect to three qualities, namely, *pitch*, *timbre*, and *intensity*.

The *pitch*, increasing as the period of the note diminishes, will vary directly as the number of vibrations per unit of time.

The *timbre*, as Helmholtz has shewn, depends on the harmonics of the fundamental simple vibration, which are present.

While the *intensity* increases and diminishes with the amplitude of the vibrations.

Theoretically speaking, the transmission of different notes, in so far as regards only their different pitches, by means of electricity is a comparatively simple thing. We have only to arrange so that when we sound the note to be transmitted at, what in Telegraph parlance I shall call, the "sending station," its vibrations shall be communicated to a moveable conductor, which shall make and break contact between a battery and the line with the precise frequency of the vibrations it takes up. Thus for each contact made, a current will be sent to the line; and a series of periodic currents will be received at the distant station, the length of whose period will depend on the pitch of the note sounded at the sending station. These

periodic currents being made to operate, a suitable receiver (electro-magnetic, as in Reiss's: or electrostatic as in Varley's) in the distant station will there reproduce a note of precisely the same pitch as the note originally sounded in the sending station.

By this arrangement each contact made in the sending station will transmit a current of definite magnitude, depending on the strength of the battery employed. All the current waves thus sent to the line will be precisely similar, and the only way we can modify them is in regard to the rapidity with which they follow one another.

Hence the note reproduced in the distant station will represent the original note in pitch only; the fundamental vibration will be the same, but bereft of all its harmonics. Any characteristic timbre the received note may possess will be entirely due to the nature of the receiving apparatus, and not in any degree to that of the sending apparatus.

Such, in its main features, was the Telephone of Reiss—a mere “tone” Telephone, reproducing the pitch, but losing the timbre. It is noteworthy that in such a Telephone, the intensity of the received note is entirely independent of the intensity of the original note. So long as the original note is strong enough to efficiently work the battery contact, we can, within certain limits, vary the intensity of the received note at pleasure, by varying the strength of the battery employed.

Now the Telephone before you not only conveys the pitch, but also reproduces the timbre with such exquisite accuracy, that a known voice is at once recognized by the ear. Moreover, it is not only sensible to musical tones, clang-tint and all, but to any noise, so that it is essentially a “sound transmitter.”

To facilitate the comprehension of the construction of the instrument, I have had a large-scale section drawn. *NS* is a hard steel rod, permanently magnetized. (See Plate III.)

A is a short piece of soft iron, of somewhat smaller diameter than the rod, screwed in to its end *N*. *A* becomes magnetized by induction, so that virtually *AS* forms a single magnet.

B is a circular elastic diaphragm of soft iron about four thousandths of an inch thick.

CC is a narrow circular coil, of the thinnest silk-covered copper wire, surrounding the iron core *A*.

DED is a light cylindrical wooden case.

The magnet *NS* is fixed to the wooden case by means of a screw at *E*.

The diaphragm *B* is fixed to the wooden case at *DD*.

The hollow part of the case surrounding the coil *CC* acts as a resonator.

This constitutes the whole apparatus. The apparatus in the sending

and receiving stations are precisely similar. We have simply to connect the one end of the coil of wire in each station to the line wire, and the other end to the return wire or to earth.

The currents are produced magneto-electrically at the sending end of the line, and are received electro-magnetically at the distant end.

Now returning to the figure we see that we have a soft iron induced magnet A surrounded by a coil of wire C , and opposite the end of the soft iron core A we have the soft iron diaphragm B .

Lines of magnetic force radiate away from the core A , some towards the disc B , others away from the disc towards the distant end S of the permanent magnet. These lines of force penetrate through the coil of wire C .

So long as the disc B remains at rest, the lines of force emanating from A remain stationary; but if the disc B be moved in towards or out from A , the lines of force will increase or decrease in number and will change in direction.

When the lines of force move, they cut the convolutions of the coil of wire C at right angles. Now we know that if we move a conductor across the lines of force in a fixed magnetic field, or, what is the equivalent, as in this case, move the lines of force across a fixed conductor, an electromotive force is produced in the conductor.

Hence in this case, motions of the disc B will produce electromotive forces in the wire of the coil C .

In fact, if we attach the ends of the wire of the coil C to the terminals of a sensitive galvanometer, and press the disc B in with our finger, we shall see a throw of the needle in one direction, indicating a transient current through the galvanometer. Holding the disc B pressed in until the index of the galvanometer comes to rest, and then releasing it, we shall see a throw of the needle in the opposite direction, indicating a transient current through the galvanometer in the reverse direction to the first. (Mr. Brough showed this experimentally with a Thomson's Reflecting Galvanometer.)

The relative direction of the current is in each case, according to Lenz's Law, which is only a statement of a particular case of the general Law of the Conservation of Energy, such that the magnetic field it produces tends to resist the motion impressed on the diaphragm B . Knowing the polarity of the permanent magnet NS , we can at once infer the absolute direction of each current from Ampère's Rule.

When we press the diaphragm in, we have to do work. Part of the work thus done takes the form of the potential energy of the bent diaphragm, while the other part takes the kinetic form of the transmitted electrical current. When we release the diaphragm, it returns to its initial

position, in virtue of its elasticity, and its potential energy is converted into the kinetic form of an electric current transmitted in the reverse direction to the first.

The magnitude of the electromotive force produced in the coil will be proportional to the number of lines of force cut through per unit of time; and will, therefore, be clearly proportional to the rate of displacement of the diaphragm *B*, and thence to the energy of the impact we impress on the disc *B*.

Small impacts will produce small electromotive forces: large impacts large electromotive forces.

Moreover, the inertia of the diaphragm is so small, that it is always ready to receive fresh impressions, which will be simply super-imposed on those already existing.

Lastly, the iron core *A* being so short relatively to its diameter, and being initially so highly magnetized, readily receives and loses the small accessions of magnetism to which it is subjected.

The result of all this is, that variations of pressure on the disc *B* will always give rise to electromotive forces proportional to their magnitude.

Thus if we sound a note in front of the disc *B*, not only will it impart its fundamental vibration to the disc, but also the subsidiary vibrations representing its harmonics.

Hence, not only will a principal periodic electromotive force, corresponding to the fundamental vibration of the note, be generated in the coil *C*, but also minor electromotive forces, corresponding to the harmonics.

And, finally, not only will a series of principal current waves, corresponding to the fundamental vibration, be sent to the line, but on their contour will be impressed the minor undulations of electrical potential representing the timbre of the original note,

The action of the apparatus in the receiving station will be at once apparent. There, the received currents flowing through the coil of wire, in their turn re-act on the diaphragm *B*. The diaphragm, like the mirror of Thomsen's Cable Galvanometer, has no fixed zero, but is ready at every moment to follow each wave. The motion of the diaphragm sets the air in vibration, and reproduces the original note.

The sensibility of the apparatus as a receiving instrument is extraordinary. Certainly the *strongest* current with which it is at any moment worked does not exceed $\frac{1}{1,000,000,000}$ of the centimetre-gramme-second unit current. The current with which our relays are worked in India is 400,000 times as strong.

The practical objection to the instrument in its present form is that the forces concerned are so microscopic. The consequence is that the

sound produced by it is feeble; and that its action is easily interfered with by induction. It is impossible to employ it on one of a number of over-land wires, while the other wires are being worked in the ordinary way, on account of the induced currents; but a sub-marine line is free from this source of disturbance, and Mr. Preece informs me that the Telephone has been successfully worked through 60 miles of cable: I believe between Dartmouth and Guernsey.

Professor Bell has himself explicitly stated that he has not brought forward his Telephone in its present form as a perfected instrument; but because it has reached a stage of great theoretical interest, and one not altogether destitute of practical applicability. He, and his co-adjustors in Boston, are still labouring to perfect it.

In speaking through the Telephone, we should not shout, for shouting tends to stress the diaphragm to its maximum, where its sensibility is least, and sounds may easily be lost. The great point is to combine a sufficient strength of voice with clear and deliberate utterance.

After the reading of the paper, Mr. Brough gave a practical demonstration of the working of the instrument. With the kind permission of the Surveyor General, communication had been made between the Society's Rooms and the Observatory at the Surveyor General's Office, a distance of half a mile, and the sounds of the voice, whistling and a musical box were successfully transmitted between the two points.

MR. BLOCHMANN exhibited rubbings of the following Persian inscriptions, which were received from Mr. H. James Rainey, Zamíndár of Khulná, Jessore.

I.

"This rubbing," Mr. Rainey states, "is taken from a slate slab, which is placed on the west side of the interior of a large well, situated a short distance beyond the southern gateway of the Munger Fort, and to the south-west of the Station Racket Court, on one side of which building is a Bath, to which the well supplies water." (*Metre, short Hazaj*).*

بعد دولت مخصوص خانی * که بادا تا ابد دور بقایش
 بنا گردید نهر باغ جائے * که جالہ باغ شد دلکش ثنائیش
 زہجرت درہزار و ہفتہمین سال * مرتب شد بنای دیر پائیش
 چو جالہ و چاہ در صورت یکے بود * فزود آن باغ را جالہ بجائیش
 شدش تاریخ چاہ باغ در دھر * فزون آمد ز چاہ باغ ہائیش

1. During the time of the rule of Makhshús Khán—may it last for ever!—
2. The aqueduct of the garden was made in a way that the grandeur of the garden is his (or its) pleasing praise.

3. In the year 1007 of the Hijrah this longlasting building was erected.

4. As the words چاع 'grandeur', and چاه 'a well' have the same form, the grandeur of the garden increased by it (the well).

5. Its chronogram lies for ever in the words *cháh-i-bágh*, 'the well of the garden,' but the letter *he* in it is to be left out.

Adding up the letters of *cháh-i-bágh* and subtracting five for the *he* to be omitted, we get 1007 H., or A. D. 1598-99.

Regarding Makhsús Khán, *vide* Aín translation, Vol. I, p. 388. He is the founder of 'Makhsúsábád', the *Muxadavad* of our old maps, which name was subsequently changed to Murshidábád by the famous Murshid Qulí Khán.

II.

"The second rubbing", Mr. Rainey writes, "is taken from a slate slab, lodged over the centre eastern door of a Mosque House, now occupied by Mr. A. V. Roberts, District Engineer (who gave me these rubbings) and owned by C. Aguilar, Esq. This house faces the Racket Court on the southern side, and is divided from it by the large public road running there east and west."

افضل الذكرا اله الا الله محمد رسول الله * بناء مرزاني ولي بيگ كولابي بوقوف
لعل بعمار * نهاده بناء مسجد يكهزار و هفتاد و چهار *

The best praise is—"There is no God but Allah, Muhammad is Allah's prophet."

The building of Mirzání Walí Beg of Koláb, under the direction of La'li the architect. The building of the mosque took place in 1074 [A. D. 1663-4.]

The rubbing has مرزاني *Mirzání*, instead of مرزا *Mirzá*. The Dictionaries do not give the word.

The inscription spells معمار *ma'ammár*!

Dr. RÁJENDRALÁLA MITRA exhibited a copper plate inscription lately received from Mr. W. R. Davies of Bhágalpur. The plate measures 15·5 × 7·7 inches, and has on the top a cast copper seal, six inches high. The name on the seal is that of Náráyanapála Deva, and the legend over it is the Buddhist wheel of the law, mounted on a pedestal, and supported on the two sides by two deer. Below the name is a sprig with two leaves and a flower. The inscription on the plate is in a modified form of the Kutila character, and extends to 29 lines on the front, and 25 on the reverse, side. Its language is Sanskrit, and its purport the grant of a village named Mukutika for the use of S'iva Bhaṭṭáraka and his followers. The grant was made on the 9th of Vaisákha, in the 17th year of the donor's reign, when he was encamped at Mudgagiri, modern Monghyr. The document was composed by his minister Bhaṭṭa Guravo, the same who recorded the Buddal inscription noticed in the volume of the Journal of the Society, and engraved by Madghadása, son of Subhadása.

The genealogy of the donor begins with Gopála, the same whose name occurs in the Monghyr plate translated by Wilkins (*Asiatic Researches* vol. I. p. 123.) He had two sons, Dharmapála and Vákpála, who successively succeeded him. The last appears under the name of Devapála in Wilkins' plate. His sons were Devapála and Jayapála who seem to have reigned one after another. The son of the last was Vighrahápála, who married Sujjá, a daughter of the Haihaya race, by whom he begat Náráyanapála. A transcript and a translation of the document will be published in the next number of the Journal.

Dr. RÁJENDRALÁLA MITRA also submitted three large bricks brought by him from one of the arches of the great Temple at Buddha Gayá. Two of them were shaped like voussoirs, having the upper side longer than the lower, and the sides curved to correspond with the curve of the arch. The upper side measured 16 inches and the lower 15 inches, the breadth being 9 inches. The third was a perfect parallelogram, 15 × 9. In presenting them he gave a short account of a tour he had recently made in the Gayá district in search of antiquities, and of his researches at Buddha Gayá. He said that at the beginning of the year the king of Burmah had deputed two persons to repair the Buddhist temple at Buddha Gayá, and these persons had for some time carried on their work, when in June the circumstance was brought to the notice of Government, and he was requested to go to Buddha Gayá, and report to Government as to what should be permitted in the way of repairs, so as not to mask or modernise the old monument. When Dr. Mitra came to the place in September last, he found the Burmese gentlemen had already cleared an area of about 250 × 230 feet around the great temple; dug out the foundations of the surrounding buildings for bricks, levelled the ground with rubbish, raising thereby the level by nearly five feet, removed the old granite pavement, reset it on the higher level, demolished the pavilion of the Buddhapad, which had stood in front of the temple, built a new retaining wall to the west of the platform round the sacred Bo Tree, and enclosed the cleared area by a new wall. They had also destroyed the stucco ornaments and mouldings in the interior of the sanctuary and covered the walls with plain chunam plaster. Under the circumstances Dr. Mitra could not trace the locale of the several buildings which Hiouen-Tsang had described as standing round the temple. By a careful study of the mouldings still existing on the exterior of the temple he had prepared restored drawings of the southern and the eastern façades of the temple, and suggested to Government that the repairs may be permitted according to the drawings. The drawings were exhibited to the meeting as also a large collection of sketches of the various objects of antiquarian interest which he had met with in course of his tour. He also announced that he had collected 85 pieces of sculptured stones at Buddha

Gayá, a part of which he had suggested should be presented to the Society. Among these stones there were several pillars, rails and coping stones of the old Ásoka railing round the temple. One of the stones bore a large inscription in the Láṭ character of the 3rd century, B. C., and another in the Gupta character of the fourth century A. D.

Adverting to the arches which he was the first to bring to the notice of the public, Dr. Mitra said that there were altogether eleven arches in the temple, four over doorways, two over passages leading to the sanctuaries, and five forming vaulted roofs. Seven of these were pointed Gṛthic, and four semicircular. They were built of well-dressed bricks, shaped like voussoirs, and set in clay cement. The bricks were set lengthwise, touching each other by the ends, and not side by side as is usual in the present day. This arrangement, conjoined with the defect in the cement, made the arches weak; but they were true radiating arches, *i. e.*, a series of blocks so formed as to fit in and disposed in the line of a curve, the blocks supporting each other by their mutual pressure, and the entire structure supported at the two ends resting on piers and not horizontal ones, formed of projecting bricks which were so common in India in former times. When Dr. Mitra first saw the arches in 1864, he had only two hours to devote to the examination of the ruins, and he then thought that they were synchronous with the shell of the temple. But further and more careful examination had now convinced him that the temple had originally been built without any arches, the opening in front having been closed by gradually projecting bricks, which left a very high triangular opening, very like what was now to be seen in the old temple at Konch. The object of this opening was to throw the sunlight at dawn on the sacred image in the temple. It was, however, found exceedingly inconvenient, as it brought in the rain-water, which deluged the sanctuary. The interior was therefore divided into three storeys, by building two vaulted roofs, and the entrances were arched over, and provided with doors. This, however, was done before the seventh century, for when the Chinese traveller Hiouen-Tsang, visited the place in 637 A. D., he found the different storeys and the pavilion in front, which stood over a vaulted roof, and described them in detail. He said they had been built after the temple (*en suite*) but did not give any date. General Cunningham accepted the opinion of the Chinese traveller, and believed that the arches had been built long before the 7th century. Concurring in this opinion, Dr. Mitra observed that the fact would inevitably lead to the conclusion that the arches had been built by the natives of India without any aid from foreigners. Had they learnt the art of building arches from the Western nations the Persians, Greeks or Romans, they would have for certain reproduced the foreign model, and arranged their bricks in the same order in which those nations did, and used the same cement which their teachers did. But they

did nothing of the kind. They arranged their bricks in the order they thought best, and that was decidedly inferior. They knew the use of surki and chunam cement, and used it extensively in forming mouldings and images, and on their roofs and copings, and had they seen it used by the Persians or Greeks in the construction of the arch, they would have followed the example; but they did not, depending entirely on the strength acquired by the shape of the bricks, and the lateral pressure of their voussoirs. One important element in an arch was the key-stone. In the foreign models this is placed in the centre of the arch; but the Hindu or Buddhist builders had apparently never seen this arrangement, and, following their own idea, placed it on a side of the centre, wherever the exigencies of their mode of building rendered it most convenient. Taking these facts into consideration Dr. Mitra was disposed to maintain the opinion which he had expressed on a former occasion that the arches were both in conception and execution purely Indian.

Mr. H. F. BLANFORD said that the question of the arch in the Budh Gayá temple had been very fully discussed at more than one meeting of the Society about 1864, and his recollection was, that it was generally agreed by competent judges, that the apparent arch in question was not structurally an arch at all: besides which, it was of much later date than the body of the building. These conclusions did not seem to be invalidated by Dr. Rájendralála Mitra's present description.

The PRESIDENT said:

The Society is indebted to Dr. Rajendralal for his luminous statement as to the arches at Budh Gayá. Whatever may be their actual age, he has at least made it clear that they are an addition to the building long subsequent to the date of the original structure.

Nor can they be, as he has demonstrated, termed true arches. It seems to me very clear that the idea which they exemplify is derived from the wells built of bricks forming a segment of a complete arch, such as are found at any Hindu ruins of an early date, such a wall round on its side would give an example of a double arch just like those of the Gayá temple. In short, the Gayá arches may be described not as arches, but as structures showing progress towards the discovery of the true arch.

Mr. H. F. BLANFORD read extracts from three letters from Mr. S. E. Peal, of Sapakati in Assam, relative to pot-holes, to the geological structure of Goalpara Hill, and to Mr. Peal's observations on the movements of the clouds in Upper Assam. The first passage was written with reference to the discussion of Dr. Feistmantel's paper on 'pot-holes,' which took place at the meetings of the Society in March and June. Mr. Peal writes,—“I see Dr. Feistmantel has been treating us to a disserta-

tion on 'pot-holes' and doubts whether your statement that they are exceedingly common, is correct. From a boy I can remember them, and was never particularly aware that any other explanation than running water, sand and gravel was necessary. Out in India, here in Assam, I find them almost the only common characteristic of the water-worn forms. I do a good deal of Rob Roy canoeing in cold seasons, up the gorges of the rivers coming from these Naga Hills, and so have ample opportunity for studying them (if necessary). On one occasion up the Tankak river, at a place where a bed of sandstone crosses and causes a fall of some 10 feet, large surfaces are exposed in the dry season; and the surface of the rock is full of pot-holes. I once caught thirteen good large turtle, each in a hole, head downwards; some wet sand and gravel at the bottom kept them from being quite dried up by the sun. Holes two and three feet deep—quite round and nearly vertical.

At another fall, I, one day, saw the spray flying back and upwards in such a peculiar manner, that I went over and examined closely, and discovered it was simply millions of small fish, 4 and 6 inches long, all trying to jump the fall, up stream, and that a tolerably large pot-hole was half full of fish, which served for the supper of our camp. * * * Up the Disang F. R. Mallet and I saw some curious sections of pot-holes, in a large mass of exposed sandstone. The holes were pretty close, and of sizes from 6 inches to a couple or three feet in diameter, and from 5 to perhaps 8 or 9 feet deep. They may have been more, as they ended in deep water."

The next passages read, refer to Goalpára hill and are as follows:—"I see the Glacier question is on the tapis. I have been trying to convince Mallet that Goalpára hill is a moraine. Seeing that Goalpára hill is only about 500 feet* above sea-level, I am afraid Mallet won't be convinced. The hill has large, angular, grey, metamorphic blocks, lying on the surface, and bedded in contorted gravel and sand; no bedded rock above on the hill." "I stayed on it for over a fortnight in 1878, and it was while watching excavations for gravel near the top, that I had my attention first roused by the extraordinary colour and curvature of the sands, embedded in layers; * * * some beds of sand dark rose colour, white, yellow, brown, and even bluish grey, contorted, and having coarse gravel and small blocks of stone here and there. * * * I don't know much about glaciers but the formation was so peculiar, I noted it well at the time. I found no scratched stones, but the big blocks on the hill, more or less angular and partially embedded, are hornblende,—so Mallet says, after I had sent him some pieces. Where this hornblende came from, I cannot guess. The hill is

* It is less. The Meteorological Observatory which is on the top of the hill is 386 feet only above sea-level, and 249 feet above the highest flood level of the river.—H. F. B.

gravelly, all through seemingly; and rests on sandstones, bedded and seen on the level of the river,—and not above, as far as I can see. How these great blocks of dark grey rock got up on the hill top was the puzzle to me. They seem scattered about on its surface, top and sides; and the hill is isolated, not overhung by any higher land. * * * The blocks of hornblende are probably up to 4 or 5 tons, now and then, and both isolated and grouped; quite irregular and more or less angular. They seemed to me like the blocks carried along a glacier surface. However, it may, after all, be easily soluble by some other means, and not need a large glacier to account for it. * * * These gravelly hills are not common in Upper Assam, which is a dead flat; not a stone of any sort to be seen.”

Mr. BLANFORD said that the sketches of contorted and coloured sands which Mr. Peal had sent, certainly reminded one much of certain superficial deposits of the English river valleys, which were attributed to the action of ice. But he was hardly prepared to accept the idea of a great glacier filling the Assam valley, without very much stronger evidence. If the structure described be really due to ice action, it would demand a change of climate of less magnitude, to suppose that the deposits were due to river ice in winter. Perhaps a climate which admitted of glaciers in the Nāga hills down to 4,500 feet, as described by Major Godwin-Austen,* might also admit of river ice, in winter, within 500 feet of the present sea-level.

The last extract read had reference to the drift of the clouds in Upper Assam. Mr. BLANFORD said that he had suggested this class of observations to Mr. Peal, with a view to verifying the suggestion made in a paper on the Physical Explanation of the Inequality of the two semidiurnal Barometric Tides, published in the 45th volume of the Society's Journal; viz., that there was a flow of air in the day-time from over the valleys, to the mountains on either side, and a return flow at night. Mr. Peal writes—“About winds, I can tell you that I have pretty steadily had my eye on the clouds, upper and lower, since your last, and am still more struck than ever, with the remarkable regularity of the flow and counter-flow. The night winds (if any) travel steadily and slowly from the SSW. or WSW. (within three points) and do not change till 9 or 9½ A. M. when a counter-current sets in from the very opposite point, say NE. to NNE. This continues more or less all day, as a surface and upper wind, but I can see no trace of a wind to or from the hills, and never remember to have noticed such a wind, except in squalls, and I am pretty near a good mass of hills that should shew any thing of the kind. Our worst squalls are from the NW. * * * As the cold season comes on, I find the NE. wind begins earlier. It is, at times, now seen at 8 A. M. but *seen* above and not *felt* below where all is still and under a dense fog. As the sun rises, the latter dissi-

* Journ. As. Soc. Bengal, Vol. xliv, Part 2, p. 209.

pates; but not till say half-past 9, does the air below move, so as to be felt as a light breeze, which freshens till say 11 A. M. and remains till 2 P. M. when it dies off slowly, and all is still, till the light evening or night airs again set in from SW. to WSW., the two winds being hardly from opposite points; they are more like this [sketch showing the directions to be NNE. and WSW.]. I will keep this question of the winds in view as the season goes on, and, ere done with it, may mention, that in arranging houses, such as lines, godowns, &c., we generally place them so as not to be in the NE., SW. direction more than we need or are obliged to."

On the above passage Mr. BLANFORD remarked "Mr. Peal's observations then, do not confirm the idea of a diurnal interchange of the upper strata of air between the mountains and the valley, but they show a very decided movement towards the sea in the day time, with the reverse at night; such had been indicated in the case of Calcutta in the discussion of the anemometric records;* and, as regards the higher cloud-bearing strata, had been established by frequent observations on the movement of the clouds over the same place. That such a movement takes place, as a general law, had been indicated, on theoretical grounds, in the paper above referred to, and, in a subsequent paper read before the Society at the meeting in March last, it had been adduced in explanation of the alternation of land and sea breezes on coast lines. It was nevertheless extremely interesting to find that this diurnal oscillation of the winds was so regular and well marked, far up in the interior, viz., in Upper Assam. Of course so general a movement must, in a great measure, mask any mere local movement, such as that between valleys and mountains; (supposing the latter to exist). Within the last few days, another very interesting observation on this outflow of the atmosphere from the land to the sea, above the diurnal sea-breeze, had been made in a balloon ascent at Bombay, by Mr. Simmons Lynn; an account of which has appeared in the newspapers. On ascending at Bombay at 4h 40m. in the afternoon the balloon was first carried by the sea-breeze to the S. East, but having attained an elevation of 5000 feet was carried off by the upper current slowly to N. W. This observation is of great interest as assigning a datum for the vertical thickness of the sea-breeze current.†

* Indian Meteorological Memoirs, Vol. I, p. 12.

† The following is the account of the aeronaut published in the 'Englishman' of the 30th November, extracted from the 'Times of India.' In two minutes from the time of starting, (at Lal Bâgh gardens on the Parrell Road, Bombay) I found myself at an altitude of 3000 feet. I proceeded at this elevation in a course S. E. by S. about 6 minutes, and determined, if possible, to continue in this direction across to the opposite shore, but I was doomed to disappointment. When I had reached about one-third across the surface of water in the line above given, the gas rapidly expanded and fully

MR. H. B. MEDLICOTT said he scarcely liked to bring forward only current observations of his own as against the more deliberate observation of another; but, as the point at issue was of such importance he would not withhold the suggestion he had to make. On his way to Upper Assam in 1865, he stopped a few hours at Goalpára and made some notes upon the little hills upon which the station is built. He then had a first opportunity of observing to how great a depth and how completely the gneissic rocks become decomposed, even on steep hill sides, when protected from denuding action by very dense vegetation. The resulting clay might readily be taken for a deposit; and the undecomposed harder spheroidal masses of granitoid gneiss, that often remain quite unaffected, have all the appearance of boulders. But he particularly recollected puzzling for some minutes over what seemed a contorted layer in the clay. He had, however, to conclude that it was the remains of a string of quartz in contorted schist, all the rest having become reduced to earth. It was in fact this observation that convinced him of the true nature of the clay covering these low hills.

He did not pretend to say that Mr. Peal's observation and his own referred to the same features, but the possibility of its being so was sufficient excuse for recording his note.

Owing to the lateness of the hour the papers could not be read, but with the consent of the meeting the following were taken as read.

1. *Memorandum of the diurnal Variation of atmospheric Pressure at the Sandheads*, by CHAS. HARDING, ESQ., with a prefatory note by HENRY F. BLANFORD, *Meteorological Reporter to the Government of India.*

This paper will be published in the Journal, Part II.

2. *Catalogue of the recorded Cyclones in the Bay of Bengal up to the end of 1876*, compiled by HENRY F. BLANFORD, ESQ., *Meteorological Reporter to the Government of India.*

This paper will be published in the Journal, Part II.

distended the flaccid portion of the balloon. This caused her to ascend very rapidly to an altitude of 7,500 feet, but I found that my course was reversed to NW, and I was leaving Bombay at a considerable speed towards the Arabian Sea. * * * I discharged a sufficient quantity of gas to descend to an elevation of 5000 feet. Then I found myself exactly balanced, with the car in one atmosphere and most of the sphere of the balloon in another. The balloon at this moment ceased to revolve on its vertical axis, one side, that towards the East, being very cold, and that towards the West much warmer. I now descended to an elevation of 4000 feet, and proceeded in a northerly [*sic*] course, but just by way of experiment I re-ascended to 5000 feet and found that the balloon was again making for sea in a North-Westerly course, exactly at the same altitude as before. * * * I continued the descent and found I was proceeding very slowly in the same course as at first."

3. *Contributions to the Geography and History of Bengal*. No. IV.—By
H. BLOCHMANN, M. A.

(Abstract.)

The essay notices the following points :—

(a.) *Inscriptions*. The Society has received from Maulawí Sayyid Iláhí Bakhsh Sáhí, of Máldah, rubbings of nine new inscriptions from Gaur, of which the most important are—(1) An inscription of 617 H. (A. D. 1249) of Jalál-uddín Mas'úd Jání, governor of Bengal. This is the oldest Muhammanadan inscription hitherto discovered in Bengal. (2) An inscription of Yúsuf Sháh, of 884 H. (A. D. 1479), ranking in beauty after the Ádínah Mosquo inscription. (3) A Mahmúd Sháhí inscription of 943 H. (A. D. 1536), from which we see that Mañanúd Sháh's nickname was *Badr-i-Sháhí*, which explains the occurrence of this name on Mahmúd Sháh's coinage.

Maulawí Sayyid Iláhí Bakhsh Sáhí has also written in Persian a historical work, entitled 'Khurshed-i-Jahán-nuná', containing a description of Gaur and Máldah, of which an English translation will be given.

The best thanks of the Society are due to the Maulawí Sáhí for his disinterestedness in placing his materials at the service of the Society.

(b.) *Coins*. Three new coins have been received for description from Mr. W. Campbell, Jalpaigori, viz., one struck by Fath Sháh in 887 H. (A. D. 1482), and the other two by Husain Sháh. Figures of the coins will be given. The latter coins have enabled me to solve the puzzling legend* on many of Husain Sháh's coins. The king describes himself on them as the conqueror of Kámrú, Kámtah, Jájúgar, and Ásám, just as the Madrasah inscription of Gaur, discovered by Mr. Westmacott (Journal, As. Society, Bengal, Pt. I, for 1874, p. 303) describes Husain Sháh as the conqueror of Kámrú and Kámtah.

(c.) *Chronology*. The chronology of Bengal history, which may now be said to rest on a secure basis, is curiously verified in several points by Chinese historical works. M. Pauthier, in his "Examen Methodique des faits qui concernent le Thian-tehu ou l'Inde, published in 1839, mentions that Aíya-sse-ting of Pang-ko-la, i. e., Ghiyás-uddín (A'zam Sháh) of Bengal, sent several embassies to China, which the Chinese returned. The last return embassy arrived in Bengal in the tenth year of the Chinese cycle called *young-lo*, and assisted at Ghiyás-uddín's funeral. According to Prinsep's tables, the tenth year of the cycle *young-lo*, would correspond to 1395 A. D., or 799 H., and this is the last year found by Mr. E. Thomas on A'zam Sháh's coinage. Another Chinese embassy arrived in Bengal in the 13th year of

* *Vide* Journal, As. Socy. Bengal, 1873, Pt. I, p. 202, note.

the same cycle, when *Saï-fe-ting* is mentioned as the reigning monarch. This would be 1398 A. D., or 801.2 H., when, according to the testimony of a coin in the Society's cabinet, *Saif-uddîn* Hamzah Sháh, was king of Bengal.

It is to be hoped that further researches in Chinese history will add to our knowledge of Bengal history.

Regarding Rájá Káns Náráyan of Táhirpúr, after whom the district of Rájsháhi is named, additional information has been obtained. Dr. Rájendralála Mitra succeeded in obtaining a copy of the genealogical tree of the Rájás of Táhirpúr, which shews that Rájá Káns was the grandson of Rájá Bijaya Lashkar. Just as some of the Mahárájás of Jaipúr received the title of 'Sawái', or one and one-fourth, to indicate that each was more than *one* man, so does the title of 'Lashkar' signify that the holder was considered in value equal to an army. It is also worth noticing that a large parganah in Rájsháhi has the name of Lashkar. Rájá Káns's grandfather, therefore, must have been a commander of distinction.

The above mentioned Chinese annals do not give Rájá Káns's name; the embassies were only renewed twenty-three years later, during the reign of Muhammad Sháh, Rájá Káns's son.

4. *On the Bharrs of Bundelkhand, with an account of an Inscription in Páli characters.*—By VINCENT A. SMITH, B.A., C.S.

THE PRESIDENT said that as the evening was far advanced, he would not ask the Secretary to read the paper. The essay, with a few omissions, would be published in the Journal (No. III, for 1877). He would, however, exhibit the Páli copper-plate, which accompanied the paper, and ask Dr. Rájendralála Mitra to offer some remarks on the plate, which was a clear forgery.

DR. MITRA observed that the inscription was remarkable in many respects. It was the only document in the ancient Lát character, which bore so recent a date as Samvat 1404. It was, likewise, the only record of a purely historical character which had been found engraved on a metal plate. It afforded, moreover, the only instance in which the Lát character had been used to record a document in the Sanskrit language. The purport of it was a long protracted war which had been carried on on the banks of the Virabhadrá river between the Bharrs and the Lodhis, the former headed by one Kanja, and the latter by Sankara. The war terminated in the overthrow of the Bharrs, when the images of the Bharrs were carved in stone, and those of the Lodhis made in alto-relievo, and left on the battle field. The document was inscribed, says the writer, on a bell-metal plate in Páli character by the priest of the Bharrs in compliance with the order of the Lodhí king. Now, the facts which make the record most important are just such as are calculated to excite doubts about its authenticity. Both the Bharrs

and the Lodhís were perfectly unlettered, very primitive people, and it is difficult to conceive that they should have retained a thorough knowledge of the Lút character when every body else in all India had for centuries entirely forgotten it. That a conqueror should wish to perpetuate the memory of a successful war was but natural ; but one would suppose that in such a case he would employ a person of his own side to write it down, and not employ the priest of his enemies. Nor is there any evidence to show that such a record was ever ordered by any mediæval Hindú or aboriginal king to be inscribed on a small metal plate. Such a plate could be seen by nobody, and would be lost in no time. A large stone, or the scarp of a rock, would be the proper receptacle for it ; but it was not thought of. The character, too, in such a case would be that which was best known, and not what was quite unintelligible to the people of the country. How the writer came to know that Páli was the name of the character, it is also difficult to conceive. Prinsep, when he first discovered the key to the alphabet called it Lút, because it occurred in its fullest extent on the Lút inscriptions of Aśoka. Subsequently, when it was found that the language of the records bore a strong resemblance to the Páli of Ceylon some people called it Páli ; but the true Páli character as still extant in Ceylon and Burmah is quite different, and the name is a misleading and incorrect one. How did the Lodhís commit the mistake ? The word Páli in their day would have applied to the Sinhalese Páli ; and not to the character of the Lút. Supposing that the Lút character was called Páli in their time, why in selecting it the Páli language was not also selected ? Again, had the so-called Páli, *i e.*, the Lút character, been then well known, why were not the Páli numerals also used ? The writer evidently knew them not, and therefore employed the modern Sanskrit figures slightly mystified by putting an extra scroll or two here and there ? Further, the material of the record is called Kánsa or " bell-metal," and that metal is held by the Hindus to be impure, and never used for ceremonial purposes. In the Sástras copper is the metal commended for sásanas ; brass is occasionally used, but never the kánsa. The speaker could not make out whether the plate was of bell-metal or brass ; but he thought it looked very like the latter. It was besides a rolled plate, not a hammered or cast one, and bell-metal, being brittle, can neither be hammered nor rolled into plates. Taking it to be brass, it should be remembered that laminating rollers were perfectly unknown in India four hundred years ago, and even now are known only by name from the circumstances of rolled plates being brought out from England for sale in this country, and from some rollers being used in the Government mints. No one in India uses rollers for laminating brass. And this fact was alone sufficient to show that the plate was a forgery. A piece of rolled brass of the size of the plate was not worth more than four annas, and punching the letters on it would not cost much

more, and such a record could be easily prepared. Dr. Mitra was of opinion that some one who had got hold of a copy of Prinsep's plate of the Lāt alphabet, had got up the record to impose upon Mr. Smith. In Prinsep's time the Pāli numerals had not been discovered. It was only the other day that General Cunningham discovered only a few, and as this was not known to the forger, he was driven to the necessity of using the Sanskrit figures slightly altered. It seemed, too, that the man knew nothing of the Bharrs until he saw the name in English letters. In Sanskrit and Hindī the word is, and should be, written with the ञ with a dot under it, to mark its peculiar sound. In English this cannot be reproduced, and the usual practice is, to write the word with two *rs* at the end. In Sanskrit this double *r* is never permitted; but, having seen it in English with a double *r*, the writer at once copied it in the Pāli character, and in a Sanskrit document. He had to prove his statement before an Englishman, and, apprehending lest the use of the dotted ञ should lead to doubts, he sacrificed Sanskrit grammar, and the usage of the country. It might be asked what would be the object of such a piece of imposition? But from the days of Wilford there have been so many attempts of the kind made by Paudits, that it is scarcely necessary to dwell upon it at length. The smile of a Sahib of high rank and the rewards expected are quite sufficient to account for such wicked acts.

The PRESIDENT said after the very clear statement made by Dr. Rajendra Lal, for which the Society was much indebted to him, there could be no doubt that the bronze plate in question was an impudent forgery. It was almost superfluous to multiply proofs in addition to those brought forward, but at least it was fair to ask why, if the ancient character was preserved the ancient numerals were not preserved also, and why with the characters of 250 B. C. were associated not the numerals of that date but the numerals of to-day?

Again the transliteration gave, not perhaps good Sanskrit, but at least intelligible sense, certain errors being overlooked. Still it seemed to the President very difficult to get the transliteration somewhat differently from the text of the plate; the very first letter of the first line might possibly be read as "go", but it was more like "ta." Moreover, unless the writer was very unversed in the character he used, the "dhavya" in the third line would surely have the vowel mark attached to the "y" rather than to the first letter of the compound, and the President thought that a scribe of Asoka's date would have written the "marhavirrya" of the transliteration.

Without going further, it seemed only too probable that the plate was produced from the transliteration, and not the transliteration from the plate, and that Mr Vincent Smith had unfortunately stumbled upon a Hindu "Simonides."

The reading of the following paper was postponed—

Pali Studies. No. 2. Vuttodaya. By Major G. E. FRYER, Deputy Commissioner, British Burma.

LIBRARY.

The following additions have been made to the Library since the Meeting held in November last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS,
presented by the respective Societies or Editors.

Berlin. Die Königliche Preussische Akademie der Wissenschaften,—Monatsbericht, Juni, Juli, 1877.

Juni. *Siemens*.—Über die Abhängigkeit der elektrischen Leitungsfähigkeit des Selens von Wärme und Licht. *Peters*.—Herpetologische Notizen.

Bombay. The Indian Antiquary,—Vol. 6, No. 73.

Dr. Muir.—On the question whether Polyandry ever existed in Northern Hindustan.

Calcutta. The Geological Survey of India,—Records, Vol. X, Pt. 3, 1877.

Dr. Feistmantel.—Notes on Fossil Floras in India. *W. Theobald*.—On the occurrence of Erratics in the Potwar, and the deductions that may be drawn therefrom. *F. R. Mallet*.—Limestones in the neighbourhood of Barakar.

———. The Mahabharat,—Vol. 3, No. 15.

———. The Rig Veda Samhita,—Vol. 1, No. 3.

Cambridge, U. S. The Museum of Comparative Zoology at Harvard College,—Bulletin, Vol. 3, Nos. 11—16.

———. Memoirs,—Vol. 2, Nos. 9, 10.

London. The Athenæum,—Nos. 2607—2611, 1877.

———. The Geographical Magazine,—Vol. 4, No. 10.

———. The Geological Society,—Quarterly Journal, Vol. 33, No. 131.

———. Nature,—Vol. 17, Nos. 415—419, 1877.

———. The Royal Asiatic Society,—Journal, Vol. 9, Pt. 2, July, 1877.

E. Thomas.—The Early Faith of Asoka. *H. H. Howorth*.—The Northern Frontagers of China, Pt. 2. The Manchus. The Northern Frontagers of China, Pt. 4. The Kin or Golden Tatars. *M. H. Sauer*.—On a Treatise on Weights and Measures, by Eliyá Archbishop of Nisibin. *Sir T. E. Colebrooke*.—On Imperial and other Titles. *Capt. C. J. F. Forbes*.—Affinities of the Dialects of the Chepang and Kusundah Tribes of Nipál, with those of the Ifill Tribes of Arracan. *A. H. Schindler*.—Notes on some Antiquities found in a Mound near Damghan.

———. The Zoological Society,—Proceedings, Pt. 2, 1877.

Lieut.-Col. R. Biddome.—Descriptions of three new Snakes of the Family *Uropeltidæ* from Southern India. *Mr. Selater*.—Remarks upon a two-horned Rhinoceros killed in 1876 near Comillah, in Tipperah, and on a living specimen of *Rhinoceros Sondaicus*, from the Sunderbans. *C. G. Danford*.—On the Mammals of Asia Minor. *Arthur, Marquis of Tweedale*.—Descriptions of three new Species of Birds from the Indian Region.

Transactions,—Vol. 10, Pt. 2.

Palermo. Società degli Spettroscopisti Italiani,—Memorie. Dispensa 9, Settembre, 1877.

Notizi di Calcutta. Lettera del P. Lafont al Prof. Tacchini. Riassunto delle protuberanze solari e della macchie osservato alla Specola del Collegio Romano nel giugno 1877. Macchie solari osservato a Palermo nei mesi di luglio agosto e settembre 1877, da P. Tacchini e G. de Lisa.

Paris. La Société de Géographie,—Bulletin, Septembre, 1877.

Dr. J. Harmand.—Notes sur les provinces du bassin méridional du Se Moun (Laos et Cambodge siamois).

Schaffhausen. Die Schweizerische Entomologische Gesellschaft,—Mittheilungen. Vol. 4, Heft Nro. 10; Vol. 5, Heft Nro. 1-2.

Washington. The United States Geological and Geographical Survey of the Territories,—Bulletin, Vol. 2, No. 4; Vol. 3, Nos. 1-3.

———. The United States Entomological Commission,—Bulletin. Nos. 1, and 2.

Yokohama. The Asiatic Society of Japan,—Transactions, Vol. 5, Pts. 1-2. Pt. 2. J. H. Longford.—A Summary of the Japanese Penal Codes.

BOOKS AND PAMPHLETS,

presented by the Authors.

ANDERSON, A. Corrections of and addition to the "Raptorial Birds of North-Western India," Pts. 1 and 2. Pamphlet.

CHAMBERS, C. and F. On the Mathematical Expression of Observations of Complex Periodical Phenomena; and on Planetary Influence on the Earth's Magnetism. Pamphlet.

CHAMBERS, C. The Absolute Direction and Intensity of the Earth's Magnetic Force at Bombay, and its Secular and Annual Variations. Pamphlet.

HAYDEN, F. V. Explorations made under the direction of, in 1876. Pamphlet.

———. Catalogue of the Publications of the U. S. Geological and Geographical Survey of the Territories, 2nd Ed. Pamphlet.

———. The Grotto Geyser of the Yellowstone National Park, with a descriptive note and Maps, and an illustration by the Albert-type process.

———. Sixth Annual Report of the U. S. Geological Survey of the Territories, embracing portions of Montana, Idaho, Wyoming, and Utah; being a report of progress of the Explorations for 1872. 8vo., Washington, 1873.

———. Preliminary Report of the U. S. Geological Survey of Wyoming, and portions of contiguous Territories. 8vo., Washington, 1871.

MCCRADY, J. Gymnophthalmata of Charleston Harbor. Pamphlet.

———. Description of Oceania (Turritopsis) Nutricula, N. S. and the

Embryological history of a singular Medusan Larva found in the Cavity of its Bell.

PRATAP NARAIN SINGH. *Isvara Tatva. A Treatise on Nyaya Philosophy.* Pamphlet.

MISCELLANEOUS PRESENTATIONS.

The Indian Antiquary, Vol. 6, Pt. 73, 1877.

FALLON, S. W. DE. A New Hindustani-English Dictionary, Pt. 10-11.

HOME DEPARTMENT, GOVERNMENT OF INDIA.

Records of the Geological Survey of India, Vol. 10, Pt. 3, 1877.

Annual Report on the Insane Asylums in Bengal for 1876, by Dr. F. J. Beatson.

Report on the Financial Results of the Excise Administration in the Lower Provinces for 1876-77.

The Indian Forester. Edited by Dr. Schlich, Vol. 1, Nos. 1-4, Vol. 2, Nos. 1-3.

THE GOVERNMENT OF BENGAL.

Report on the Administration of the Central Provinces for 1876-77.

Report on the Trade and Resources of the Central Provinces for 1876-77.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Annual Report of the Board of Regents of the Smithsonian Institution. 8vo., Washington, 1876.

THE SECRETARY.

COPE, E. D. The Vertebrata of the Cretaceous Formations of the West. Royal 4to., Washington, 1875.

F. V. HAYDEN, Esq.

Annual Report of the Trustees of the Museum of Comparative Zoology at Harvard College in Cambridge, U. S., together with the Report of the Curator for 1875. 8vo., Boston, 1876.

A. AGASSIZ, Esq.

Maqámát-i-Badí'-i-Hamadání. Lithograph, Lucknow, 1877.

H. BLOCHMANN, Esq.

Engravings from the Ancient Marbles in the British Museum, Pts. 1, to 11 Folio.

OWEN, R. Descriptive and Illustrated Catalogue of the Fossil Reptilia of South Africa in the Collection of the British Museum. Folio, London, 1876.

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LIST OF PLATES .

IN

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Pl. I (p. 2). View of the Gorge near Chandeshwar, Kamáon, with some of the 'Cup-marks'.

Plates II to IV (pp. 3, 4). Ancient Rock Sculpturings in Kamáon.

The cup-marks, &c., shewn in sketches III A, IV A, IV B, IV C, on plate III, and in sketches III B and III C (wrongly marked III A) on plate IV, are on the face of the rock, and not on separate slabs, as would appear from the sketches.

Pl. V (p. 7). Rough sketches shewing the permutations of 'Cup-Marks' on Monoliths in the Central Provinces.

Pl. VI (p. 8). Cup and Ring Cuttings on Stones and Rocks in Europe.

Pl. VII (p. 37). The Manipuri Alphabet.

Pl. VIII (p. 37). Specimen of Manipuri Writing.

Pl. IX (p. 41). Map of El-Shemál in 'Omán.

Pl. X (p. 149). Facsimile of a Copper-plate Grant from Cuttack.

Plates XI and XII (p. 180). Burial Places with Cruciform Monoliths, near Mungapet in the Nizám's Dominions.

Plate XIII.—Not issued.

Pl. XIV (p. 235). Rough sketch of a Sculptured Slab at Tika-Mau, Bundelkhand, with two seals or amulets.

ERRATA, &c.

IN

JOURNAL, ASIATIC SOCIETY OF BENGAL, PART I,

FOR 1877.

- Page 1, line 4, *for* five plates *read* six plates
 „ 7, l. 3 from below, *for* attempt *read* attempt to
 „ 62, l. 11, and p. 90, l. 6, *for* Hojr *read* Hajar
 „ 73, l. 22, *for* er-Rasis *read* er-Resis
 „ 83, note ³⁴, line 1, *for* 'Abd-esh-Sha'bi *read* 'Abd esh-Sha'bi
 „ 90, in note to vv. 4 and 5, *for* marābiu-n-nujūm *read* marābi'u-n-nujūm
 „ 93, in note to v. 48, last line but one, *for* imāmuhā *read* amāmuhā
 „ 94, in note to vv. 60, 61, second paragraph, line 4, *for* rajeز *read* rejeز
 „ 95, in note to v. 71, *for* el-Bediyy (twice) *read* el-Bediy
 „ 130, l. 8 from below, *for* ξωρικός *read* ξωρικός
 „ 163, l. 13 from below, *for* præcipua *read* præcipuo
 „ 244, l. 22, *for* p. 262 *read* pp. 266, 267
 „ 252, l. 7 from below, *for* (side) *read* (face)
 „ 253, l. 10 from below, *for* sakla- *read* saqla-
 „ 290, l. 6, *after* post-positions *add* and takes possessive affixes
 „ 291, l. 8, *after* (c) *insert* : The Future Participle itself is often used as a noun of the agent ; e. g. *bil-gu* 'that which makes known,' 'a sign'; *ach-qu* 'an opener,' 'a key.'
 „ 293, l. 11, *Add* :—Of the two forms ending in *ku* and '*k* respectively (whether used substantively or adjectively) the former generally conveys an *active* meaning, and the latter a *passive* ; e. g. *bil-gu* 'that which makes known', *bil-ik* 'that which is known,' 'knowledge'; *ach-qu* 'an opener', 'a key', *ach-qu* 'opened', 'open' (adj.).
 Also add *after* note * :—E. g. *sao'q* (adj.) 'cold', *sao'q-luq* 'coldness' ; from the verb *sao-maq* 'to be cold.'
 „ 303, l. 10 from below, *after* *nari* *insert*—*or ? ari*
 „ 307, 1st line, *after* "then," *insert*—*ari* "moreover, again"
 „ 309, l. 8, *after* "singly," *insert*—"each"
 „ 333, l. 3, *for* his hundred desires *read* the face of desire
 „ 333, l. 22, *for* go forth *read* go up into the minaret
 „ 340, l. 3, *Add* :—He caused the Qorān to be read through, and bestowed the merits of this on the souls of the martyrs.
 „ 340, l. 9, *for* defeated *read* conquered
 „ 342, l. 13, *for* the skirt of his robe *read* his stirrup

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part I.—HISTORY, LITERATURE, &c.

No. I.—1877.

Rough Notes on some Ancient Sculpturings on rocks in Kamáon, similar to those found on monoliths and rocks in Europe.—By H. RIVETT-CARNAC, C. S.

(With five plates.)

At the meeting of the Society held in Calcutta in February, 1870, the existence on the tumuli of Central India of “cup marks” similar to those found on the Stone Circles and Monoliths of Northern Europe was briefly noticed by me (*see* Proceedings of the Asiatic Society for February, 1870, p. 57). It may interest the Society to learn that, during an autumn holiday in the Kamáon hills, I have come across many other markings on stones and rocks closely resembling those described by the late Sir James Simpson in his ‘Archaic Sculpturings’*, the work noticed at the meeting of the Society above referred to,—and that, on this occasion, the markings found have not been confined to cups and circles, but include rough sculpturings of a somewhat more defined type than those previously noticed.

2. At a point about $2\frac{1}{2}$ miles south of Dwára-Háth, and 12 miles north of the Military Station of Ráníkhét in Kamáon, the bridle road leading from the plains through Nainí Tál and Ráníkhét to Baijnáth, and thence on to the celebrated shrine at Bidranáth, is carried through a narrow gorge, at the mouth of which is a temple sacred to Mahádeo, where the pilgrims who follow this route generally halt for a short time, and where from the position of the temple in the defile, the priest in charge

* Archaic Sculpturings of Cups, Circles, &c., on stones and rocks in Scotland, England, and other Countries. By Sir J. Simpson, Bart., D.C.L., Edinburgh, Edmonton and Douglas, 1867.

can conveniently levy contributions on all passers-by. The temple will not be found marked on the one-inch-to-the-mile map of the Great Trigonometrical Survey, but it is locally known by the name of Chandeshwar, and the above description will perhaps be sufficient to enable any who care to visit the spot to find its position without difficulty.

3. About two hundred yards south of the temple, towards the middle of the defile, and to the right hand of the traveller from Ránikhet to Dwará-Háth, a rock partly covered with low brushwood rises at an angle of 45° to the height of some seventy feet above the stream. The rock has been much worn by the action of heat and damp, and to a passer-by would not at first sight appear to possess any interest, but when carefully examined in a good light, it will be found to be covered with "cup marks" and sculpturings, the principal forms of which have been figured in the accompanying rough sketches.

4. A reference to Sketches I to V in the accompanying plates will shew that in Europe, the "cup marks" or holes scooped out on the face of the rock, and noticed by me at the meeting of the Society above referred to, predominate. On the Chandeshwar Rock in a space measuring 14 feet in height by 12 in breadth, upwards of 200 such marks may be counted. They are of different sizes, varying from six inches to an inch and a half in diameter, and in depth from one inch to half an inch, and are generally arranged in perpendicular lines presenting many permutations in the number and size and arrangement of the cups. These exactly correspond with the "First Type" of the marks found in Europe described at page 2 of Sir J. Simpson's work above referred to, and figured in many of the plates with which his book is illustrated.

5. In the portion of the rock shewn in Plate II, commencing from left to right and taking the upper ledge, first comes a row of four small cups, then three rows of cups each $3\frac{1}{4}$ inches in diameter, the first line containing nine, the second seven, and the third seven cups. Then follows a row of 15 cups somewhat smaller in diameter, the 11th and 15th (the last) of which are distinguished by an incised ring surrounding each cup, corresponding exactly with the "Second Type" figured at Plate I, and described in page 4, of Sir J. Simpson's work.

6. Then follow three lines containing respectively 17, 14, and 15 small "cups". The 13th and 17th (the last) cups of the first row are "ringed" and belong to the "second type". The last cups of the second and third line are distinguished by what Sir J. Simpson describes (page 5) as a "groove or gutter", leading from the cups downwards, and of which several specimens will be found figured in his work. The next group of three lines consists of 8, 7, and 6 small cups respectively, surrounded by three lines in the shape of a fork. Then follow 11 lines, first two lines

containing respectively 6 and 5, then three lines of 6, 6, and 7, then another arrangement of three lines with 8, 10, and 11, and lastly yet another arrangement of three lines each of 8 cups. All these cups are small and similar in type to those already noticed.

7. On the lower ledge beneath the first arrangement of three lines of large cups, a further combination of three is noticed, a large cup, then a line of four, then three. These are weather-worn and somewhat indistinct, and may perhaps have been continuations of the upper line. To the left is yet another combination of three, two large cups, the upper one of the first line with a groove, the two next both grooved, and the lower groove joining the two cups, the third also grooved. Then follow two lines containing the one six, the other seven large cups.

8. Sketch III, on plates III and IV, shews cup marks on three separate portions of the rock, the first (A) to the left containing eight cups, one of which is grooved, the second (B) a straight row of sixteen cups, with a row of four running off at right angles in the centre. The last (C) is a curious arrangement of thirteen cups all with grooves or gutters, similar to those figured in Plates IX—XIV and XX of Sir J. Simpson's work.

9. The sculpturings shewn in Sketch IV of pl. III are of a somewhat more elaborate type. The first (A) has perhaps been intended for a cobra, or a leaf. The second (B) is curious from the combination of lines and large cup-marks, some of which are six inches in diameter, and in shape is not unlike the "Swastiká". The third (C) is of a somewhat similar type, and may be allowed to claim relationship to Fig. 15, Plate II, of Sir J. Simpson's work. The sizes of the markings are roughly noted on the sketches. I have neither the time nor the appliances at present to draw them to scale.

10. From the villagers, and from the old priest at the temple hard by, no information was to be obtained of the origin of these markings, beyond that "they were so old that the oldest man in the village had no knowledge of who had made them, nor had they been made in the time of their father's father, but they were most probably the work of the giants on the goálás (herdsmen) in days gone by." Much information was perhaps hardly to be expected from the class of persons questioned, but the subject of their possible origin will be noticed more in detail in later paras. of these notes.

11. On visiting the temple sacred to Mahádeo at the entrance to the gorge, I could not help being struck by the peculiar construction of many of its shrines as bearing a marked resemblance to these rock markings. In addition to the principal shrine, placed within the temple itself, a massive little structure, built up of large stones, many of which would appear to have been taken from Buddhist ruins so plentiful in the neighbourhood of Dwará-Háth, I counted 37 minor shrines within the walled enclosure by

which the temple is surrounded. These consist mostly of a rough pedestal formed of loose stones surmounted by a *Mahádeo* and *yoni*. The *yoni* in the largest of these shrines was a solid block of stone, cut to the well-known "jew's-harp" shape, the upright *Mahádeo* being slightly carved at the summit and base. Some half a dozen others were more or less solid and well made according to the conventional construction of these symbols. In one case the stone which did service for the *yoni*, was the cushion-shaped finial of some Buddhist temple, the *Mahádeo* being represented by a carved head with high raised cap broken off from some neighbouring ruin. The fragment had been inserted cap downwards in the square hole by which the cushion had been fixed on to the top of the original structure.

12. The remaining shrines were of a much poorer type. But this last class was to me much the most interesting, as suggesting a possible connection between the rock markings and *lingam* worship. Rough sketches of these types will be found in plate III, which accompanies this paper. The position and arrangement of these symbols and the veneration paid to them, some having been quite recently decked with small offerings of flowers, left no doubt that they equally with the larger and more solid shrines represented the *Mahádeo* and *yoni*. But whereas in the first noticed and better class, as will best be explained by the section E in plate III, the *Mahádeo* is represented by an upright stone, this other and poorer type is without the upright, and is apparently a conventional rendering, or sketch of these symbols, roughly cut on the stone, the inner circle representing the *Mahádeo*, the outer circle the *yoni*, the line or lines the gutter, by which the libations and offerings are drained off from this as well as from the more elaborate class of *Mahádeos*.

Of this poorer class, *i. e.* those without the upright, some 20 or 30 may be counted in the Chandeshwar enclosure, from the well-defined inner and outer circles shewn in Fig. A sketch IV of pl. III, to the very poorest class in Figs. B and C, sketch V, which is little more than a rough cup-mark surrounded by a circle and "gutter", cut on an easily worked slab, split off from some neighbouring rock. On one such slab I found cup-marks together with the symbols, but as the cups were in all probability on the slab before it was split off from the rock and made to do service on the top of the shrines, no particular significance can be claimed for this circumstance. To facilitate reference, in case no copy of Sir J. Simpson's work is at hand, the several types noticed in the Archaic sculpturings have been copied, and accompany this paper.

13. In the centre of the yard, is a monolith *Mahádeo* of 4½ feet in height above the ground, shewn in pl. IV, sketch VI, fig. A. It has no markings on it,—but together with all its surroundings seems very old. The priest in charge of the temple held that most of the shrines were very old, and accoun-

ted for their large number by saying that the yard was the burial-place of men of great sanctity, some of whom had been brought from great distances for interment there, and that Mahádeos of an elaborate or poor class were placed over the tombs according to the means of the deceased's friends. I have at this moment no means of verifying whether any particular class of Hindus are buried in the hills, or whether my informant intended to convey that ashes only were deposited beneath the shrines, but on this point there will be no difficulty in obtaining information.

14. A few days later I visited, in company with Mr. William Crow, the proprietor of the beautiful Dúnagiri estate, the summit of the Pandakoli (Col du Géant?) mountain, which rises to a height of nearly 8,000 feet above the sea, to the north-east of the Dúnagiri Tea Factory. Here we found a small open place of worship, composed of two stone circles of the shape and dimensions shewn in pl. IV, Fig. B, sketch VI. The outer circle was of rough stones piled one on the other, with large stones at the entrance. The inner circle was partly of large stones about $3\frac{1}{2}$ feet measuring above the ground, partly of smaller ones—very large stones not being available on the summit. The entrance was to the south. The inner circle was 8 feet, the outer 16 feet in diameter. In the centre of the inner circle were several *Mahádeos*, stones split off from the neighbouring rocks and roughly shaped. The shrine was open to the elements on all sides, save where it was partially sheltered by a wild guelder rose to the branches of which some rags had recently been attached as votive offerings by visitors to this place of pilgrimage. A small iron lamp, an old bell, and three small tridents, or '*trisuls*', (from the summit of the hill, by the way, a grand view of the three snow peaks of the Trisul mountain and of Nanda Devi may be obtained) completed the furniture of this rustic temple. No priest lives on the hill, which is too cold, jungly, and inaccessible for lengthened sojourn, but a fair is, I learn, held there in the spring, when many pilgrims, chiefly barren women, visit the shrine.

15. The construction of the temple, as shewn in pl. IV, sketch VI, fig. B., appears of some interest when considered in connection with the rock cuttings and shrines at Chandeshwar, some 15 miles distant. Here, as the sketch will shew, are two circles, complete save where the "gutter" forms the entrance. The *Mahádeos* are in the centre of the inner circle.

16. Another circumstance perhaps deserving of notice is the position of a monolith Mahádeo, $5\frac{1}{2}$ feet above the ground, situated 8 feet south-west of the shrine, a second monolith of almost the same size was 80 feet due west of the first. If I remember right, the shape of the temple is the same, or nearly the same, as that of Stonehenge, and Avebury, and the outer monolith is in the same position to the Pandakoli shrine, as the "*Friar's Heel*" is to Stonehenge.

17. Local tradition ascribes the construction of the temple to the Pándús from whom the hill takes its name. In the small lake, visible from the summit, and about 6 miles north-west the Pándús are supposed in days gone by to have washed their garments, whilst the hill top, with its, for the Himálayas, broad expanse of grassy level, was the drying ground for the Pándú-linen. Mr. Craw, who with his gurr and dogs has visited most of these little known recesses of the Himálayas, has kindly promised to keep a look out for similar remains during his sporting excursions.

18. Subsequently, on the march between Dúnagiri and Sameshwar, I came across some more monoliths, on the right hand side of the road, close to the Lodh Tea Factory. They are apparently the remains of what once was a considerable structure. In shape the monoliths exactly resemble the Chandeshwar. Mahádeo. But on the one is carved a circle intended perhaps for the moon; on the other, what looks like a sun. If I mistake not, there is supposed to be some connection between sun and moon worship and the worship of the *Mahádeo* and the *yoni*, the sun taking the place of the *Mahádeo*, the moon of the *yoni*.

19. Some three miles further on, on the right hand side of the road just above a little village distinguishable by its Deodár trees, and a small temple belonging to the Bidrapáth Mahant, I halted for a short time to examine a mass of boulders lying round a mound, which from a distance bore some resemblance to the tumuli common in Central and Southern India. On its summit was a shrine about two feet high of peculiar construction, consisting of a sort of box, like a Kistvaen, formed of four slabs of stone imbedded in the earth, a fifth and movable slab forming the top, or cover. Within, sheltered from the weather by these slabs, was a small stone Mahádeo, or *ling*, daubed with red paint, and a small iron lamp. Outside the Kistvaen was a second and smaller stone *Mahádeo*, and on it, apparently taking the place of the red paint, a cup mark.

20. A further examination of the site indicated the existence round the mound of an outer and inner circle of stones, the larger of about 30 feet in diameter. The mound was in the midst of irrigated, and well cared for rice fields, and the boulders, lying about in disorder, had apparently been disturbed to make way for the plough in the absence of a Kamáon "Sir J. Lubbock's Act" for the preservation of ancient remains. But the circular shape of the mound and of the arrangement of the boulders surrounding it, some of which were too heavy to be displaced, was still traceable. One of the boulders, a huge mass measuring 7 feet in height by 13 feet in length by 9 feet in breadth, which could successfully defy most attempts at displacement, had five rows of cup marks still traceable on it, whilst other rows much weather-worn could with some difficulty be made out. About half a mile further on, I again found cup-marks on a somewhat smaller group of boulders, among the rice fields.

21. The villagers' view of the matter was, as usual, that the marks were those of the giants, and that the little shrine at the top of the hill was the burial-place of a holy man, the same as the Chandeshwar account. The Kistvaen was evidently modern. But this fact would not affect the view that the original tumulus was of old date. It may often be noticed how later comers adopt the sites chosen by their predecessors for places of worship or sepulture. Of this Dwára-Háth is an example, whilst perhaps one of the most striking instances may be seen in the Chandá District at Narkandá, not far from the confluence of the Waingangá and the Godávarí. Here a ridge of rocks running across the stream forms a natural anicut, ensuring a fine and constant reach of deep water during even the hottest and driest months. On the left bank of the stream are groups of temples of some half a dozen distinct types, from the Cyclopean class, massive blocks of stone without ornament, and evidently of a very early date, up to the recent florid additions of the Rájás of Nágpúr. And a case came under my own notice some years back, in which a fakír was buried in the middle of one of the largest of the stone circles of the Higna group, near the city of Nágpúr, a tumulus certainly several hundreds of years old. The first comers chose good sites and built and buried there. Later on, the remains of temples or tombs suggested the eligibility of those sites, and the later comers borrowed not only the idea of the position, but building materials also from the ruins.

22. In the above remarks I have tried to confine myself to what I saw and heard on the spot, and have as far as possible avoided mixing up therewith speculations on the origin and significance of the remains. I am generally content to do this, and to leave the analysis of what I may collect and what may appear of interest, to those, who, from the appliances and information at their disposal, are able to subject such enquiries to reliable tests, and to extract from my rough jottings any grains of the true ore which may be therein contained. And on the present occasion, having only one or two books of reference with me, (my baggage being necessarily restricted, during a march among the Himálayas to what can be carried on the backs of a limited number of men) it may be especially undesirable to advance what may appear to be very crude theories regarding the significance of these markings. I am nevertheless tempted to add to my notes a few remarks and suggestions, more in the hope of evoking some discussion from those who are better informed than myself, and who, with the library of the Asiatic Society ready at hand, can supply omissions or correct any misapprehensions into which I have fallen, than with any intention of appearing to attempt dogmatise on a subject on which I cannot, of course, claim to write with any sort of authority.

23. In the first place I would desire to notice, with reference to the

markings described in paras. 8 to 10 of these notes, (for this paper has been divided into paragraphs, in order to facilitate reference to the several points mentioned) that since I had the pleasure to bring to the notice of the Society the existence of markings on the stone circles of Central India similar to the Archaic sculpturings on similar circles in Europe, that the subject has been advanced a stage by the discovery, not only of the single type of "cup marks", but of two or three other distinct types, nearly exactly resembling those treated of, and figured by, the late Sir J. Simpson in his work already alluded to.

24. In addition to the "cup-marks" of which so many examples are to be found at Chandeshwar and in the Sameshwar valley, we have now the second type, *i. e.* the cup mark enclosed in a circle—also the types given at Figs. 14 and 15 of Plate II, and in other plates, of Sir J. Simpson's work. A comparison of the accompanying sketches, which, although rough, are sufficiently accurate, with the plates in Sir J. Simpson's volume, will, I believe, leave little doubt of an extraordinary resemblance between the markings found on similar classes of remains in Northumberland, and in many parts of Scotland, Ireland, Brittany, Norway, Denmark, &c.

Extracts from Sir J. Simpson's descriptions of these markings and tracings of some of the plates accompany this paper, in case the work should not be immediately available.

25. Sir J. Simpson holds that these markings in Europe are not of natural formation, and an examination of these series of lines and holes in Kamáon will lead to the same conclusion, and leave little doubt that the same view holds good in India also. The distinct rows in which the cups are arranged, the shapes other than that of "holes" assumed, indicate design and suggest that the sculpturings are artificial, not natural. Sir J. Simpson meets the view that those in Europe are of recent formation and have been made perhaps by the shepherd boys on which to play a sort of game of draughts, by shewing that the cup-marks are more often on the sides of boulders, or on the face of rocks, where no such game could be played; and the same remark holds good for the Central Indian and Kamáon cup-marks. And, after all, even admitting that this view correctly accounts for the cup-marks, it would not dispose of the origin of the other rough sculpturings.

26. Moreover the people of the neighbourhood have no tradition of the origin of the remains or of the markings on them save that they are the work of the giants, or the *goálás*, which in their minds means the far past. No one there has any knowledge of the markings being of recent construction.

27. And here attention may be called to the circumstance that the idea of such remains being the work of the "*goálás*", or herdmen, is identical in Kamáon and in Central India, also many hundreds of miles south. In Central India tradition points to the existence of a *Goálá* dynasty, a

race of nomads, "Shepherd Kings", who held the country before the advent of Aryan civilisation, and here among the Himālayas, the same idea seems to prevail, and to the same people is attributed the construction of similar Cyclopean works. All this would seem to indicate that the markings are not of modern origin.

28. Then as to the significance, if any, of these markings. First as to the cup-marks. They are generally arranged in rows, large and small. Sometimes a row is composed entirely of large and small marks. Often the large and small holes are found in juxta-position. The combinations and permutations are numerous. This would seem to suggest that the markings have some significance, and are not so arranged for ornament only. In a brief paper written for the late Earl of Mayo, shortly before his death, on the cup-markings found in Central India, and which I believe it was Lord Mayo's intention to communicate to the Royal Irish Academy, by which Society the subject of cup markings on similar remains in Ireland had been discussed, it was suggested by me that these markings might possibly represent a primitive form of writing. The Agham writing consists of combinations of long and short strokes cut on sandstone. On sandstone it would be easier to cut lines with the grain, so to speak, of the stone. To attempt to make a cup mark would be to risk splitting the slab. On the other hand to cut a line on hard trap would be difficult, whereas to work an iron instrument round and round so as to make a "cup-mark", would be comparatively easy. It was also pointed out that the American invention by which a record of the message sent by the Electric Telegraph is made by the instrument itself, the most primitive style of marking, or writing on the paper was necessarily adopted. And the letters in the Morse Code are consequently composed of numerous combinations of long and short strokes. In Army signalling, which I saw recently carried on here from the hill tops by men of the 19th (Princess of Wales's Own) Regiment stationed at Rānīkhet, the same simple system is adopted to represent letters by long and short wavings of a flag. By night a lamp is used, long and short flashes taking the place of the long and short wavings of the flag. It is then perhaps not impossible that the many permutations of large and small cup markings may have some such sort of significance having been adopted as a primitive style of record many hundreds of years back by a people who had not advanced very far in civilisation. I have not had time during my recent march in Kamāon to collect many specimens of such permutations, and have been obliged to content myself with the knowledge of the existence of such markings in many parts of the province, leaving any further investigations for some future pleasant holiday. But the permutations at Chandeshwar, as the annexed sketch will shew, are numerous enough for the sake of the argument, if

indeed it has any force at all. And the accompanying rough sketch VIII, (Pl. IV) of some of the Central Indian markings, shewing many permutations, will assist still further to explain my views, such as they are on the subject.

29. Next as to the possible further significance of some of the markings. If the remarks in para. 12 *et seq.* and the rough sketches annexed have in any way helped to explain my views, then it will be seen that a resemblance exists between the Chandeshwar rock and European markings, and the shrines in the temple at the mouth of the Chandeshwar gorge. That many of the shrines are of recent construction is evident. It will hardly be contested that the last of types 2, 4, and 5 of Plate I, of Sir J. Simpson's book, bear a striking resemblance to the *Mahádeo* and *yoni* marks on the Chandeshwar shrines. The centre mark would appear to do duty for the *lings*, the circle for the *yoni*—and the "gutter" is the depression to be found on most stone *yonis*, by means of which the votive libations are drained off from the symbols. And here it may be noticed that in Mahádeo worship, the offering of flowers, and the pouring of a libation, generally of Ganges water, over the symbols is, so far as I have seen, very general. Those who have visited Benares will remember the little spoons resembling somewhat our Apostle's spoons, some of them beautifully chased, with a figure or cobra at the upper end of the handle, used by pilgrims and worshippers at that city in sprinkling the holy water over the Mahádeos there. In Kamáon little niches are to be noticed in Mahádeo temples with stone receptacles for holy water, not unlike what are seen in churches abroad. And the temple at Baijnáth boasts of a large, well-carved figure, holding a bowl, which the priest informed me held Ganges water, and from which pilgrims sprinkle the Mahádeo placed close by.

30. Then again in connection with the monolith Mahádeos found at Chandeshwar, Pandukoli, and Lodh, mentioned in para. 13 *et seq.*, it may be worth noticing that circles, and what I will call the "conventional symbols" of the *Mahádeo* and *yoni*, are found on exactly similar monoliths in Europe; take for instance Figs. 2 and 3 of Plate XVII of Sir J. Simpson's work.

31. In India these monoliths are found in the centre and in proximity to shrines bearing these markings. Sometimes a circle is found cut on them, and again the shape of the place of worship at Pandukoli with its double circle of stones, in the centre of the inner of which are the Mahádeos, is as nearly as possible exactly that of these conventional markings.

32. If I am not mistaken, this too is the shape of Stonehenge, and other remains in Europe in the vicinity of which monoliths similar to Indian Mahádeos and bearing incisions similar to the "conventional symbols" are found. It seems then hardly improbable that the ruins in

Europe are the remains of that primitive form of worship which is known to have extended at one time over a great portion of the globe, and which still exists all over India, and that these markings are the rude records of a nomadic race which at an early epoch of the world's history left the Central Asian nursery, and travelling in different directions have left their traces, in Europe as in India, of tumuli and rock sculpturings, generally to be found in hill countries, and inaccessible spots whither at a later period they were forced to retreat before the advance of a more civilised and a more powerful race. The one being what are generally known by the somewhat vague term of Scythians or Shepherd kings, the other the Aryans, descended from the same parent stock, and who later were forced by the necessities of increasing numbers to emigrate from the common Central Asian home, and to explore and conquer the rich countries far to the West and South. Baron Bonstetten's Map of the localities in which archaic remains are found (Plate XXXIII of Sir J. Simpson's work) supports this view. Kistvaens, barrows, cup-marks, rock sculpturings, all more or less of the same type, abound in all the corners of the European Continent indicating that the people who constructed them, were driven thither by a wave of invasion surging from some central point. And so also in India, these remains are found, not in the plains and open country, but in the forests, among the fastnesses of the hills, in the gorges of the Himálayas and Nilgiris, on the Highlands of Central India in that Cul-de-sac of the Nágpúr country, which was long protected by its natural rampart of the Sátপুরas with their "abattis" of dense forest, from the effects of Northern Invasion.

33. I am aware that the view of these markings having reference to *lingam* worship is not now advanced for the first time. The subject is alluded to at page 93 of Sir J. Simpson's work but only to be summarily dismissed with the following brief remark :

"Two archaeological friends of mine, dignitaries in the Episcopal Church, have separately formed the idea that the lapidary cups and circles are emblems of old female Lingam worship, a supposition which appears to me to be totally without any anatomical or other foundation, and one altogether opposed by all we know of the specific class of symbols used in that worship, either in ancient or modern times."

I am sanguine, however, that if the late Sir J. Simpson had seen the sketches of what I have called the "conventional symbols" on the shrines at Chandeshwar, and had been able to compare them with some of the types figured in his work, he might have been inclined to modify the opinion above extracted. The treatment of these symbols is purely conventional, they bear no anatomical resemblance to anything, they are unlike many of the large well known and acknowledged representations of the *Mahádeo* and

yoni. Still they nevertheless represent the same idea. And here it may be noticed that the same argument of anatomical non-resemblance might be advanced in regard to the well known representations, common throughout India, of the meaning of which to the initiated there is no doubt at all. To the uninitiated, however, the shapes convey nothing, and I have known cases of Europeans who have been many years in the country who were quite unsuspecting of what "that jew's-harp idol", as they called it, was intended to represent. As the old priest at Chandeshwar said, "Those who can afford it, put up a big *Mahádeo*; those who can't, put up these slabs." And so also with us. The rich relations or friends of the Christian may put up over his grave a solid richly-carved stone cross. The grave of a poor man, if marked at all, has over it perhaps two pieces of wood nailed together in shape of a cross, or a cross roughly cut on a piece of stone. The Christian Church is built in the form of a cross. In Pandukoli and many other spots, the *Mahádeo* temples are built in the shape of the conventional symbols of that faith. And inasmuch as the symbols of the *Mahádeo* and *yoni* can be more conveniently indicated on stone or on paper by what may be called a ground plan than by a section, the form shewn in pl. III, Fig. A, Sketch V, was apparently first adopted, and this degenerated into the rough conventional treatment of the cup-mark and circle so common on monoliths in many parts of Europe.

33. In the view that these markings are nothing but a conventional rendering of the *Mahádeo* and *yoni*, I am further confirmed by what has recently been brought to my remembrance, of the manner in which an Amín, or native Surveyor, will indicate a *Mahádeo* temple on his plotting. I remember that the sign used to mark the position of such temples by the Amíns in the Field Survey of the Chandá Revenue Settlement, in which district I was Settlement Officer some few years ago, and where this form of worship is very common, almost exactly resembled the sketch in Figs. B and C, plate III, sketch V. It is not unlike the form of the Vestal Lamp. Indeed on the summit of a hill near Ráníkhét, on the top of a pile of stones which did duty for a *Mahádeo* shrine, I found a small slab, bearing an almost exact resemblance to the well known form of the classic lamp. In the hole into which oil is poured, a small upright *Mahádeo* is placed.

34. Perhaps enough has now been said regarding the possible significance of these markings to ensure some discussion and to elicit an expression of opinion from those who are better qualified than I can claim to be to speak with authority on the subject. I at least hope that some of the Members of the Society may be able to put me right where my information is incorrect or imperfect. Hereafter, with the help of some references and notes which I have in my library in the plains, I shall hope to be able to endeavour to trace these barrows and rocks, together with their markings,

from Madras, through Central India, and the Himālayas, and thus on through Central Asia to the Crimea and South Eastern Europe. From thence there will be but little difficulty in completing the chain, through the Continent of Europe, to our own Islands. And if this is done, then there would seem to exist a sufficiently distinct tracing of the routes adopted by the tribe, one section of which went West, the other South, in their search for fresh climes and pastures new, at a period of which there is but faint historical record, save on the rough stones and temples with their markings of a type which are common to both Europe and India.

35. Before concluding these rough, and necessarily imperfect, notes, I must add two extracts, which I have found since I began to write, amongst my limited baggage, and both of which seem to bear directly on the subjects above noticed.

At para. 17, the local tradition which attributes the construction of the circles on the summit of the Paṇḍukoli hill to the Páṇḍús has been noticed. Here is an exactly similar tradition regarding an almost exactly similar class of remains near Salem in the Madras Presidency, many hundreds of miles to the south of the Himālayas.

“In a paper on Tumuli in the Salem District the Rev. Maurice Phillips, of the London Missionary Society, arrives at the conclusion that the tumuli were the burial-places of the non-Aryan aboriginal inhabitants of the South, who are now represented by the Dravidians, and who, like the pre-Aryan inhabitants of the North, are proved by their language to have belonged to the same branch of the human family as the Turanians; that their ancient customs and religion disappeared before the combined influence of Brahmanism, Buddhism, and Jainism, precisely in the same way as the ancient customs of the Teutons, Celts, Latins, and Slavs disappeared in Europe before the influence of Christianity, or the ancient customs of the Scythians of Central Asia disappeared before the influence of Muhammadanism. If this theory be correct, no tumuli in the plains of India are later than the thirteenth century A. D. and on the Neilgherry Hills, probably none are later than the fifteenth or sixteenth century A. D. The natives know nothing about the tumuli, and according to Dr. Caldwell there is no tradition respecting them either in Sanskrit literature or in that of the Dravidian languages. The Tamil people call them Pandu-Kuris, Kuri means a pit or grave, and Pandu denotes anything connected with the Páṇḍús, or Páṇḍava brothers, to whom all over India ancient mysterious structures are generally attributed. To call anything a work of the Páṇḍús is equivalent to terming it ‘Cyclopean’ in Greece, a work of ‘Picts’ in Scotland, or ‘a work of Nimrod’ in Asiatic Turkey.”

36. And the following extract from an article in the *Madras Times* of the 7th February, 1876, bears equally on the subject.

"The village of Jala is about fourteen miles from Bangalor situated at the base of a large isolated rocky hill; upon the summit of which is a little grassy dell, stretching out in front of a cave, that has been converted into a small picturesque templo. It is but a small village, the temple is curiously built against the side of a low rocky hill, a cave forming the sanctum. It possesses no architectural beauty, and is interesting only from the fact that the priest in charge, a wild looking fanatic, apparently about sixty years of age, has never left its precincts, for more than forty years, nor has he allowed the lights in the holy place to go out for that period! The whole neighbourhood is thickly covered with cromlechs; near the village there are at least one hundred plainly to be seen. These cromlechs are surrounded by circles of stones, some of them with concentric circles three and four deep. One very remarkable in appearance has four circles of large stones round it, and is called by the natives "Pandavara Gudi" or the temple of the Pandus, who are popularly supposed to have been the descendants of the Pandavas, the five sons of the Raja Pandu.....The smaller cromlechs are designated "Pandasiara Mane" or the houses of the Pandus. This is supposed to be the first instance, where the natives popularly imagine a structure of this kind to have been the temple of a by-gone if not of a mythical race.....Many of these curious structures have a triple circle, some a double, and a few single circles of stones round them, but in diameter they are nearly equal, the outer circle varying from thirty-seven to forty feet."

37. I extract also from page 185, 5th Series VI, September 2nd, 1876, of "*Notes and Queries*", a note shewing that the custom of hanging shreds of rags on trees as votive offerings, still exists in Ireland, that country of stone circles. The sacred tree at the Pandukoli temple or stone circle was, as noticed at paragraph 14, similarly decked at the time of our visit, and the custom is, as is well known, common throughout India.

"*Anatolian Folk-lore*.—The custom of hanging shreds of rags on trees as votive offerings still obtains in Ireland. I remember as a child to have been surreptitiously taken by an Irish nurse to St. John's Well, Aghada, County Cork, on the vigil of the Saint's day, to be cured of whooping cough by drinking three times of the water of the holy well. I shall never forget the strange spectacle of men and women "paying rounds", creeping on their knees in voluntary devotion or in obedience to enjoined penance so many times round the well, which was protected by a grey stone hood, and had a few white-thorn trees growing near it, on the spines of which fluttered innumerable shreds of frieze and vary-coloured rags, the votive offerings of devotees and patients."

The proceedings at the Pandukoli Fair might be described in almost similar words.

P. S. Since the above paper was written, I had the pleasure of meeting, at the Imperial Assemblage at Delhi, Mr. Campbell of Islay, now on a visit to this country, who has taken much interest in the subject of the Scotch Rock-markings. To him I shewed copies of the rough sketches, and explained briefly the views noticed in this paper. Mr. Campbell has since visited Ayodhyá, and has been good enough to send me a note on his enquiries there, from which the following is an extract :

“ January 8th, 1877. Benares.

“ Having seen sketches and notes on rock Sculptures in India which closely resemble unexplained rock carvings in Scotland ; and having myself found one of the Scotch forms cut on a boulder in Kánggrá, I was set on the right scent by Mr. Rivett-Carnac at Delhi. Being at Ayodhyá with a Hindu who speaks good English, I got a faḳír and drew on the sand of the Gogra the figure



I asked what that meant. The faḳír at once answered,

“ Mahadéo”. I then drew



and got the same answer. At Delhi,

my old acquaintance Mr. Shaw told me that these two signs are chalked on stones in Kánggrá by people marching in marriage processions. The meaning given to these two symbols now in India is familiarly known to the people. Many other Scotch signs may probably find an explanation here. One in particular I take to be the Trisul. I brought a number of Scotch signs with me. I have got a number of marks from natives who still use them.”

Mr. Whitley Stokes, too, knowing the interest taken by me in the subject, has been good enough to send me a copy of the Journal of Royal Historical and Archaeological Association of Ireland for July, 1875, containing Mr. W. F. Wakeman's paper on Rock-markings in the County of Fermanagh.

The sketches and description of these Irish rock markings correspond almost exactly with the Kamdón markings noticed in this paper.



*The Kaimúr Range.—By CHANDRAŚEKHARA BÂNURJI,
Deputy Magistrate, Bongong.*

General features.—The Kaimúr Range is a spur of the double-ridged Vindhya. It is the more easterly of the three so called Table-lands of Central India, each of which has for its floor the three great varieties of the gray, the red, and the yellowish sandstones. It shoots out from the District of Mírzápúr in the “inhospitable regions” of which the goddess Baran has selected one of her mountain abodes under the name of Vindhya-váshiní. From this region the range stretches eastwards in a lofty plateau, forming a belt of upwards of 130 miles, with an average breadth of 35. The mighty Sona, pent up on both banks by high ridges, flows along the foot of this Table-land until touching almost the base of the northern arm under the summit of Rohtás, takes then a turn, and cuts a north-easterly course through the open plains of South Bihár. The mountain chain, however, bends northward sending out smaller spurs, until reaching Sahasráram, it may be said to terminate with the dome of the Chaudan Sayyid mount. From this point the chain relapses gradually into the plain, re-appearing once only fourteen miles off in two small blue knolls at Nokhá.

Although occupying a vast extent of country whose breadth across the plateau exceeds at places forty miles, hardly any of its peaks attains the height of 2,200 feet.* Its small elevation reminds one of the curse of Vindhya to which the Hindu mythological accounts often allude. “Vindhya, “having prostrated before his spiritual guide Agra Sila, still remains in that “posture by the command of the holy personage. This humiliation is the “punishment for his presumption in emulating the lofty heights of the “Himálaya and the Meru”. According to this legend Vindhya has one foot at Chanár, the true name of that fortress being “Charanádri,” and another at Gayá. The vulgar inconsistently suppose that the head of the prostrate mountain is near the Temple of Vindhya-váshiní.

The ancient name of the country along which this chain extends was Kaira Des, from the Daitya of that name known to tradition as its earliest king. The range was probably known as the Kairo Máli, corrupted to Kaimúr. The Puráṇas and the natives however still call it the Vindhya Máli, whose summit are crowned with the shrines of the goddess Barani under different names, Vindhya-váshiní being the foremost and more widely known than the rest. Vindhya-váshiní was the offspring of Yaśodá, being supposed to be the same child which was made over by Vasudeva to Rájá Kañśa† the

* Colobrooke's journey to Nágpur.

† ‘For Herod will seek the young child to destroy him.’ *St. Matthew*, Chap. II. The similarity of the story was pointed out by Sir William Jones.

merciless tyrant of Mathurá. Mahárāja Kañśa attempted to kill this child by dashing her against a stone. The girl, who was the manifestation of Śakti, or the creative energy of the Deity, gave the slip, hovered over Kañśa in the form of a kite, warned him of his future fate at the hands of the youth who was being reared at Gokula, and steered her aerial flight until she perched on the peak near which her shrine now stands, four miles south of Mirzápur. The entire range of the Vindhya Máli is dedicated to the shrines of Baraṇi, and is itself considered a mass of sacred matter, which the hill-men adore as *Dharti* or the earth-god. The spirit of the great goddess guards the heights of the chain and its gháts, fences its steep sides, and protects the hill-men from falls and surprises, from wild animals and wilder demons. If the votaries of Vishṇu, of Śákya and of the Sun had struggled to establish their respective cults on the right bank of the Son, the left has been held undisputedly and solely by the worshippers of Śakti. In Gayá we have the shrines of Buddha, Vishṇu and Surya-nárāyaṇa predominant in different quarters of the district. On the opposite bank we have fanes of the several manifestations of Umá alone. Vindhyeśvarí, Bhavání, Tripurá, Múndeśvarí and Tárachandí are perched on the summits of the Kaimūr Range. The goddess undoubtedly exercises great sway on these heights. Owing to her influence it is thought that demons in the shape of painful diseases kill few of the hill-men. Fewer still fall a prey to the wild animals. Peace reigns throughout the length and breadth of the Chero and Kharwár hamlets. Few crimes are perpetrated, although fewer, we suspect, are reported, and one Police head-constable accordingly, with two assistants posted on the tableland, has been sufficient for a number of years to keep British prestige alive over this extensive range.

The great peculiarity in the formation of the range is its steepness. The flat tablelands on its top are supported by precipitous sides which rise suddenly from fields where there is hardly a stone to impede the plough. About a third of these heights near the base is generally covered with a slope of rubbish which it must have taken ages to wash down. The tall crests of many a forest tree crown these slopes. But immediately above these, the sides are mere layers of primitive rocks, barren and black at places, high rocky walls standing in bold prominence against the blue sky. In others the walls bend into glens and recesses where a little dip between two summits serves as the channel for whirling cataracts. The spots below these cataracts are generally sacred pools which retain water throughout the year, and enable many important streams to flow down to the plains. "After* a clear drop of two to six hundred feet, the water splashes into a deep tarn scooped out by its continual falling, on leaving which it runs through a channel several miles in length, and obstructed

* Memoirs of the Geological Survey, Vol. VII, p. 20.

throughout its course with huge masses of rock fallen from above. From each side of the stream rise the undercliffs of the escarpment, covered with tangled jungle and debris, and crowned by vertical precipices which cut off all access to the plateau above, save by one or two narrow paths known only to the wood-cutter or the charcoal-burners, by whom alone the gorge is ever visited."

Geological features.—The escarpment of the Kaimúr Range which faces the Son for more than 200 miles between Rohtásgarh and Bilharí is nearly a straight line for the entire length, without any indentation, except the curve at Bijayagarh. The northern escarpment, however, from Sahasrára westward is deeply indented by intricate and ramifying gorges. The spurs which shoot out from the main range on the northern face seldom lie detached. They either project like bastions, or run in belts to join ultimately the chain itself, although there are some breaks between the ramparts to serve as passes to the wild glens embosomed by them.

At places the chain runs in double lines, branching off and extending for miles in two parallel high upright walls, enclosing a narrow strip of land between their feet, and displaying only a short strip of the sky over their summits. These long labyrinthine glens are cut by the beds of some mountain streams, with trees along their banks, and transparent pools along their stony beds.

The stone of the hills is chiefly composed of sandstones of different hues, varying from gray to red, either in the grains or the veins. It is to this sandstone that the mountains owe their grand appearance, displaying the most stupendous precipices. In his geological account of Sháhábád, Major Sherwill observes—"The vast precipices exhibited in this sandstone admirably display the horizontal formation of the mass; one of the precipices at the foot of Rohtás, I found by measurement to be 1,300 feet, a sheer mass of stone without a bush or tree on its surface; it is situated close to an over-hanging mass of building known as the Hajám's palace, a few minutes walk from the gateway leading up from Rájghát. The echo at this spot, which is a complete amphitheatre of precipices, is very distinct and grand, giving seven distinct responses to several syllables; the report of a gun reverberates like thunder; the sandstone at this spot is of a dark red, an overhanging rock at this spot enabling a person to look over and to fully contemplate this fearful abyss."

Next to the sandstone is the limestone. From the fact of its appearing in many places, though far apart, separated even for many miles, Major Sherwill was inclined to think that "it penetrates in unbroken stratum under the sandstone." Mixed with the limestone is chalk, called by the natives *khari matti*, "which is unctuous to the touch", "has a shiny appearance, but soils the fingers."

Hornstone, which may ordinarily be mistaken for chlorite, is found in many layers along the face of the precipice at the Tuttula Kund, four miles west of Tilauthû. I am informed that this stone is also met with at Jadunâthpur on the southern edge of the range; and four miles west of the *kho* or recess, a hill of the same mineral projects into the Son and causes rapids. The black crests on the limestones, or bands of shales near Bijayagarh, led to the belief that coal existed in the Kaimûr range. The report originated, so far back as 1837, with a Mr. Hyland, and Mr. Osborne of the Opium Department was deputed to investigate. But Mr. Osborne's, as well as later, investigations have shown that the similarity of the shales with coal ends unfortunately in the appearance, as they are perfectly incombustible and mere argilacious matter.

The sacred cave of Gupta is an opening in a calcareous hill where the flags are thin and white, approaching in appearance to unpolished slates of marble.

Gneiss and Quartz are remarkably absent in the Kaimûr Range, although they occur in the North West, in the Vindhya, and the ridges south of the Son.

From what has been written above, it may easily be imagined that the stones of the Kaimûr Range consist of two principal layers. The upper terrace is the so-called Kaimûr sandstone. The lower the limestone with bands of 'pencil'-coloured shales at places which were mistaken for coal. Major Sherwill estimated the thickness of the sandstone layer at Rohtâs at 1,300 feet, but towards the west, the escarpments are reduced to 6 or 700 feet. The thickness of the shales at Durgavatî and Bijayagarh varies from 200 to 150 feet. They are quite black and brittle.

"The stratigraphy of the hills", observes Mr. Mallet, "is very simple on the whole, the various bands being spread horizontally over wide areas, and it is only in a few special regions of disturbance that the geology is at all complicated. Taken generally, the upper Vindhya are made up of several thick masses of sandstone with alternatives of shale which in lithological character frequently preserve a remarkable uniformity over immense areas."

The southern edge of the range appears to be higher from the fact that almost all the rivers that take their rise on the plateau flow towards the north, none going towards the south to the Son. The two more important of these streams are the Durgavatî and the Karamnâsâ.

The Karamnâsâ, notwithstanding its seemingly crystal water, is a detested stream. In a country where almost every stream is a good nymph of the valley, and melts and flows either to fertilize its banks or to purify sinners, the Karamnâsâ forms an exception. Its water is unholy, and a dip into it is sufficient to destroy the virtues of the simple savage and

those of the holy saint. The common story about it is, that in the illustrious race of the sun, there lived a king by the name of Trinsankhu, who, among other horrid sins, was guilty of incest and of the murder of a Brâhman. To wash away the taint it was necessary to collect the waters of all the sacred pools and streams in the world. From the holy bath thus formed, the prince having been washed, the defiled waters flowed into a river, and formed the Karamnásá. Religious Hindus must carefully avoid the slightest touch of the waters. Beneath this superstition, there is probably a simple warning against its use on hygienic grounds only.

The Durgavatí takes its rise in the Kaderkhó, a valley of exceeding beauty, "dark, deep, and cold." Descending from the tablelands, it winds on, some six miles north, to the Sugiákhó, which strikes off to the west, and stretches some ten miles between steep walls of rock. The valley is there contracted into a few hundred feet, through which the stream cuts its course into the open country. After a very winding flow it meets the Karamnásá along with other tributaries, the entire volume of water falling on the northern slope of the range being thus ultimately drained through the channel of the Karamnásá only to the Ganges.

The Son, although it takes its rise in a more distant country, drains the southern slope, and is both a source of beauty and strength to the tract lying between it and the hill range. It is also considered a sacred stream. Mr. Wheeler gives a tradition which assigns the easterly course of the Son to disappointed love with the Narmadá. The story which is locally current here is, however, different. According to it, the Son was originally confined within the sacred pool of Amarakantak. On the banks of this pool stood the hermitage of Jamadagni, the father of Paraśurâma. Near at hand a rustic once drove his plough to which he attached a calf and its dam. The calf resented this cruelty by driving its horns into the chest of the ploughman, who died on the spot. This taint of sin turned black the white skin of the calf; on going into the pool, however, the calf was purified and regained its original colour. Paraśurâma observed this, and considered that the pure waters of the pool should be sent out for the good of humanity. He cleft the side of the spring with one stroke of his *parasu* or axe, and thus made the infant Son stream away. The left bank of the Son, which at present includes the district of Gayá, was called the Kīṭa Des.* There were few

* In confirmation of this name, the following text may be cited:

कीटकेयु गय। पुण्या ; नदी पुण्या पुनःपुनः

उदयगिरि नदी पुण्या पुण्या राजगृह बन ॥

The modern name of the पुनःपुनः is the Pun-pun. Deokuli in the Arwal Parganah was the hermitage of Chavana Muni, where an annual fair is still held. Rājagriha in Bihār is too well known to require notice.

sacred spots in this country. But the Kaira Des* which extended along the left bank of the river, was generally considered sacred, and therefore the region of the Kaimūr Range proper.

Productions. The timbers of the hills are on the whole poor. Where properly taken care of by the zemindars, such as in the glen of Koendi, the sál or sakná grows to a respectable size and serves for beams. But generally the tree is stunted. It is difficult, however, to say whether the poverty is owing to reckless and continual cuttings, or to the sterility of the soil itself. Both causes have been at work from time immemorial. Nevertheless the ásan (*Terminalia alata tomentosa*), the píál (*Buchanania latifolia*), the wild jáman, the mohná, the keond, and the arjuna grow luxuriant in the lower valleys, while the profuse scarlet flowers of the *Butea frondosa* along the slopes of the outer hills impress one with the propriety of the name of Palásas given by the ancients to the country now included in the Division of Bihár. The hills supply bamboos, and other wood which suffice for the buildings of the natives, and are taken down a great way off down the Son during the freshes.

Lac-dye is extracted from the small branches of various trees, such as the kusum and the pípal. The white silk cocoon, which is larger than elsewhere, grows on many plants, principally on the ásan tree (*Terminalia alata*). Of other forest produce may be mentioned bees'-wax, the haritaki (*myrabalan*) large and small; the baherá (*Terminalia Belerica*) used both for dye and medicine, the amla or amlaki used for pickles, a kind of *Mimosa* used as medicine in cases of diarrhoea. The catechu, cherange, a sort of small almond which is greatly relished by the Hindústání, the bagai a sort of grass extensively used for ropes, answering to the sarmangu of Bengal, the kaneri, and chitti complete the list.

The kaneri is a sort of yam resembling in appearance garlic with a slight rosy tinge; a size is made of it for dressing new-woven cloth, and the natives say that it is exported to countries beyond India.

* In opposition to a common belief among certain European scholars, Dr. Rájendra-lála Mitra, in his great work on Orissa, urges that "the policy of the Bráhmans was not to excite an *odium theologicum*, but to enlist the sympathy of the people in behalf of their creed, by advancing half way and agreeing to a compromise." As one instance to illustrate this theory, we may say that the belief that the left bank of the Son on which Buddha Gayá stands is more sacred than the right one,* was adopted by the Bráhmans from the Buddhists. The following anecdote will show what we mean: "The death of Rájá Meddan, the Balwand Ruler of the Kharwárs, was approaching. It was considered unlucky to die on the southern bank of the Son, and he was consequently removed to the northern bank where he remained awaiting his death".—*Sherring's Aboriginal Tribes.*

The chitti is a sort of hemp extracted from the stalk of a wild plant of that name whose culture cannot be too much recommended. Both in gloss and silkiness it is superior to jute or any other flax that we know of in the country. The "sal-gind" which Dr. Buchanan translated into olibanum, but by which we suspect the oil extracted from the juice of the sál tree was meant, is not at present expressed, probably owing to the gradual decay of that noble tree on the hills.

Honey is yielded by two species of bees; partly by the regular honey-bee, but mostly by the black bhringa. The latter makes its hive in the cracks and crevices of steep cliffs, beyond the reach of all animals and the havoc of man. These cliffs are generally inaccessible from the foot. But the hill-men of the Masáhar tribe, whose trade it is to dig out roots and herbs for medicines and collect honey, approach them by a dangerous device. Rope cradles are hung on trees standing on the crest of precipices. The Masáhar covers himself with a blanket, holds a torch in his hands, and waves it to and fro along the side of the steep rock hundreds of feet above the glens. Every time that his cradle comes near to the hive, he puts in his flaming torch as best he can, and thus succeeds in killing and scaring away the honey-makers. When the bees appear to have left the hive completely his demoniac rocking ceases, his cradle stops near the mouth of the crevice, he extracts the honey and takes the hive, which is broken for wax. The unholy trade continues every fortnight from the night of the new moon in the month of November to June when the largest yield is expected, June being the best season for the collection.

Of the mineral wealth of the hills the most important is Iron. There are six furnaces within the limits of the advanced outpost on the plateau, where the ore is roasted to the extent of 200 maunds per annum. The metal, such as we saw, is spotted red, and supplies the materials for all instruments of husbandry to the forest races; small quantities are also brought down to the plains where it sells at about 5 Rs. the maund. The smelting of the ore is carried on entirely by the Sahará clan of the Khamár tribe.

At present the entire value of the Iron smelted per annum is estimated at 1000 Rs. only,—200 maunds at 5 Rs. With capital and enterprise, we have no doubt, the mineral wealth of the hills could be greatly developed. Sulphate of Iron is extracted in different parts of the hills.

As has been observed above, calcareous stone abounds in every part of the Range. There are two hills on the eastern slope near Akbarpúr, which are entirely composed of limestone in different stages of formation. Some do not yet, but others melt into beautiful white lime. On the southern and eastern slopes, the quarries are close to the Son, while the Sára, a small stream which flows straight on to the Durgavatí, has a respectable channel near the quarries of Masái, and affords, during the rains, a facility of

transport to the Railway Station at Chánsá; but it is little used at present.

In the days of Dr. Buchanan there was a large mine of alum and Sulphate of Iron at the Kairýá Ghát near Rohtás, but I do not know if it is worked now. In developing the resources of the hills, British enterprise was here, as elsewhere, the great pioneer. The mine was first worked by the energy of a gentleman whom the natives, when Dr. Buchanan visited the place about the year 1808, remembered as Mr. Phojel. But with the death of the latter, the mines fell into neglect, and no one has since been attracted to the secluded valley.

The sandstone of the hills is peculiarly hard, and admits of good polish. The quarries are abundant—ashlers, paving stones, pillars, and other materials for building purposes are hewn out everywhere along the slopes. Cups, plates, mill-stones are also cut, and even the potter's wheels in these parts are made of slender slabs of sandstone. Out of the bluish block of horn-stone, images of idols are modelled and sent to Banáras and Gairik: red ochre is also taken to several towns. Regarding the quality of the sandstone Mr. Mallet observed that "it is fine-grained and homogeneous, yellowish and grayish-white in colour, occurring in beds several feet thick, and perfectly free for long distances from any kind of jointing or fissures, so that very large blocks may be excavated. Some stone finds its way even as far as Calcutta, being in use by the undertakers for tomb-stones, floorings, &c. The stone of the Jumna bridge was obtained from quarries some miles up the river. The cities of Benares, Mirzapur and Allahabad, besides others of less note, draw their supplies of building stone exclusively from the Caimures."*

The red variety is, for architectural purposes, much inferior to the white. The irregularity of its colouring greatly mars the effect, as will be remembered by any one who has visited the Táj, where the frequent juxtaposition of red and partially white blocks of sandstone and the streaked and blotched appearance of others forms a most unsightly blemish to the gateway and other outer buildings of that noble and almost faultless mausoleum.

The yellowish white sandstone is a splendid material, capable of being cut into immense blocks. Many noble buildings, extending from the palace at Bharatpur to the cupolas of Rohtásgarh, attest the durability of the Vindhyan stone.

The crops and food grains grown on the tableland are those raised everywhere in Bihár. Millet and maize are reaped in October. Wheat, barley and gram grow on the mountain top. Rice of good flavour is gathered in winter. But the cultivation of either cotton, poppy, or sugarcane is never attempted. In several places the plains immediately adjoining the

* Memoirs of the Geological Survey of India, Vol. VII, page 118.

foot of the hills are sown with indigo, but the out-turn has not yet been encouraging; the yield, according to our calculation, hardly exceeding 13 chataks of the blue dye per bigah.

The dairy produce of the hill-men consist mostly of ghí or clarified butter. After the early rains, as soon as the hills put on their green verdure, the entire stock of cows and buffaloes, counting more than 25000 herds, are taken up to the plateau to graze. The *charahas* or cowherds, some 5000 men, follow the cattle.

Extempore villages crop up on every side. The tableland presents a busy scene, while cattle-theft commences to disturb the owners. During this season the cows are milked, and ghí to the extent of at least 10,000 maunds is prepared, which at 13 Rs the maund represent the value at Rs. 130,000 per annum. When the milking season is over and the grass begins to dry, the stream of movement turns towards the plains and the temporary huts are abandoned.

Birds.—Of birds of prey the *tila*, the kite, and the smaller hawks breed on the hills, but the larger female *zerra* with which the gentlemen in these parts yet indulge in sport, like the Barons of the Middle Ages, comes from the northern countries. The larger and smaller quail, *i. e.* both the *titir* and the *bater*, are the only birds which are pursued by these hawks. The *bageri* is snared only by the fowlers. Peacocks and partridges also abound in several parts of the forest, and the *bogolu* or the heron is pursued for its feathers. We meet the yellow wren (Halud guri), the musical *shámá* like the nightingale, and the *munia* or Amedabats in the bushes, while other birds hardly larger than the little finger delight to come down to the gardens to pick up the honey, or steal a little drink from the sides of the wells or bathing-places.

Of "the favourites of the Hindu poets" the cuckoo or *kokila* raises its rich voice occasionally, and we hear one even now, as we write these lines, to tune its sweet gamuts—

"In gladsome hours of blushing spring,
Mid fragrant spring and bees on wing,
The cuckoo young doth pass his days."

Of the Indian gracile, the pied starling or *go-sálik* and the *sári* can be had by hundreds. But the real hill maina "of fine glossy plumage with permanent yellow mantle" and with varied pleasing note, which breed profusely in the hills of Orissa and Kaunjhar, is not to be found in the Kaimúr Range.

The parrot (*tiyá*) also abounds in these hills, but whether it is the Alexandrian parrot which the great conqueror took to Europe we cannot determine. It is a nice talking bird, and a story is current about one of these hill-parrots which awaked the owner of a house when a bullock was being stolen.

The *paṇḍuka*, or the dove of different sorts and hues, from the plain ash-coloured to the spotted brown, frequents almost every bush both at the foot and the top of the hills.

Aquatic birds are not to be found towards the northern slopes, owing to the heat and the want of watering-places, but in winter the *chakrabāk*, or the golden Bráhmāni geese, may be seen in pairs cutting through the silent waters of the Son.

The sportsman may have his game any time in these forests. In the Mírzāpur district, we learn, peacocks and partridges abound. Black antelopes range the open country, and the white-footed deer shelter in the deep woods. Further to the east, the Nilgái, the gour, the bear, the hyena, and the leopard infest the country; while there are glens here and there known as the homes of the royal tiger. The mungoose, porcupine, and hare also inhabit the bushes and slopes. The ring-horned deer, however, which roam by dozens, if not hundreds, in certain tracts in the Gayá district, are missed in the woods of the Kaimūr Range. The family of the monkey also, which Dr. Buchanan found to be numerous, has become scarce. The lion, the rhinoceros, and the wild elephant, which the Emperor Bábar saw close to his camp at the edge of the Chanár hills, have altogether disappeared.

Ethnology. The forests of the Kaimūr Range, hemmed in by the hills on the one side and the broad Son on the other, have in the historic period given shelter to different tribes of aborigines. The memoirs of the adjacent districts record that they receded before the wave of the Aryan migration to the shelter of the slopes and forests of the Kaimūr Range. Yet different tribes followed one another into these secluded summits, struggled, or blended with each other according to exigencies, until the "iron heel" of the Rájput settler stamped out their political life. These tribes are the Bhars, Suriyás, Cherús, Bindis, and Kharwárs, who, according to the current tradition, extended their dominions on both sides of the Ganges to the province of Audh. The Cheran Parganah and the Cheran Island on the Ganges in the Sárán district are still traced as the original settlement of the Cherús; and, although suffering humiliation from defeat in battle and from deception in the game of treachery, their scattered villages and the debris of their forts must still be the subject of interesting study to the antiquarian and the ethnologist.

At times these aborigines had their revenge. Whenever the neighbouring Aryan ruler proved weak, these barbarians repeated history, came down upon him, ravaged his land, and ruled his country. Sometimes the policy of conciliation resulted in social blending. Inter-marriage between the daughters of the Kharwár chief and a Chandel Rájput prince is mentioned in the annals of Bundelkhand. The present Rájá of Palámau, although claiming to be a Kshatriya, is suspected to have a mixed origin.

On the whole, however, the aborigines have been consigned to the lowest depths. . They live on the hills as wood-cutters and herdsmen, and, when appearing in our courts, they do so as cattle-lifters only. Unintentional as it may be, their abject condition has escaped attention; unknown to the philanthropist and unthought of by the legislator, they live the life of the animals which surround them. It is high time that something should be done for these poor people, when the triumph of peace and of peaceful industry is being extended to the remotest corners of the country.

Wave after wave as the tide of migration touched the foot of these hills, its peaks were turned into strongholds for military defence. In the remains of the forts, on the summits of the Kaimūr Range, we see the ruins of greatness of different races. In Pampápur, some miles south of Mírzápur, the ruins of an extensive strong fort mark the rise of the Bhar Ráj; on the northern slope Raghubirgarh and Simalgarh, defended by the main-range on one side and a spur which runs as a belt round them on all other sides, yet keep alive the same name. The family of Bhars, who yet own the zamíndáris round the latter forts, make every attempt to mix with, and to be known as, Purihár Rájputés. The Rájputés would, however, recognise them only as the descendants of the old Ráj Bhars. The Suriyás have also some forts in and near Bhubná, the principal one being Sirámpur. The kot, or castle, of Rámgar, although now occupied by Rájkumárs, is said to have been originally built by the Cherús who held sway at Chyápur. But the forts which the Aryan Rájputés subsequently erected there, have become more famous. On the west, Bijaigarh stands at the elevation of 2,017 feet, and on the east Rohtás at 1,485 feet. We have already described Fort Rohtás.* Bijaigarh was raised by the Gharwár Rájputés, the descendants of Maháráj Jaya Chand of Kanauj, when the Muhammadan conquest drove them to the eastern country in search of new homes. It stands on a high cliff, and gives name to a parganah around it. "The rock on which the fortress stands is so steep," that it appeared "impregnable" when Mr. E. T. Colebrooke visited it in 1798. It was, however, besieged and reduced by Col. Popham when Cheyt Singh took refuge in it, and was restored to its old chieftain, from one of whose race the Rájás of Banáras had snatched it. Shergarh is the last of the forts which was destined to be the great citadel of the Indian Empire, had fortune favoured the ambitious scheme of its vigorous founder. It was built by Sher Khán close to his native place, about twelve miles from the Grand Trunk Road, south of Jahánábád, "amidst the most magnificent scenes, and adjacent to one of the richest plains in the world." Its ramparts and bastions and battlements present a more imposing show to the places below than fort Rohtás, whose works from the height of the rock are not visible from the plain. The ascent to the

* See Mukarjī's *Magazine* for 1876.

principal *gali* is much grander than any of the approaches to Rohtās, and when seen from the north side has an appearance resembling, as observed by an European traveller, "the Castle of Durham."

Antiquities. The peak of Mungesvara, which rises to the height of 1,936 feet, has no fortress on it, but for years it was held by two Chian robbers, named Norá and Korá, who infested the Son valley, and, armed with bows and arrows, committed many daring robberies and murders. Their arrest could not be effected, as after each of their crimes, they ascended the stiff cliffs of Mungesvara, and were harboured by the rude villagers on the summits. "They were afterwards captured by the villagers, and were brought in tied on string beds*."

The northern slope of the range has been the seat of many Rájput chiefs, who, avoiding the open country in front, made the mountain range the back-ground of their koṭs or castles. The ramification of these Rájput chiefs extends from Chyápur to Sawár, and the fortresses they raised, with the high ridge and forest on one side and deep trenches on the other, plainly show that they came and held the country by military force. As the foremost spot to be taken in the line of march from the North-West, Chyápur appears to have been the field where each successive conqueror had to unsheath his sword. In the race of ascendancy it was here that the Rájput and the Páthán appear to have first met in battle, and the remains of a fort and very large tanks and scattered tombs and shooting minárs of the Afghán period, clearly point out that the importance of the place did not lie in tradition alone. At present, however, Chyápur is a decayed and decaying place, and the splendid dome and minárs† which "obtrude to the sky", and which in magnificence can be compared to the tomb of Sher Sháh alone, threaten to tumble down at no distant time. There is one religious institution, however, which has survived the storms of ages, and which continues to keep up a permanent interest in Chyápur. It is the shrine of Harsha Brahma. If Harsha Brahma had a tongue to speak, we could hear from him the story of centuries. But his votaries, who have sanctified him from a Bráhma to a god, assign a comparatively recent date, Sambat 1485, for his deification. He occupies a fane within the precincts of a very ancient fort whose walls have crumbled down, whose trenches have filled up, and whose ample gateway is the only high edifice of stone and brick which is still standing. But the massive stone walls of this gate are surmounted by an arch of small bricks, whose foils continued through its ceilings, and raise a suspicion that the fort must have been once taken and

* Dr. Oldham.

† This is the octagonal tomb of Ikhtiyár Khán, son-in-law of the emperor Sher Sháh, situated on the banks of a small stream and overshadowed by a huge ridge of the hill.

held by a Moslem. The history of Harsha Brahma is, however, enveloped in a myth. Harsha Brahma is said to have been the high priest of Rājā Śālibāhan, a Rājput chief of the country. Falling out with the Rājā, the Brāhman was deprived of his lands, and he waged a little war in which he invited the Emperor of Delhi to assist him. Whether the curse of the Brāhman or the valour of the Pathān was the cause, we will not undertake to determine, but the Rājā's power was exterminated and Harsha Brahma rose triumphant. Dying soon after, he was sanctified,* and his shrine stands on a raised terrace with no other shelter but the branches of an old pipal tree, and continues to draw crowds of daily pilgrims from distant places. His name is greatly dreaded, and no oath in the country, even within the sacred limits of Banāras, would be more solemn than one taken by the name of Harsh Bābā.†

A couple of days' leisure enabled us to pay a visit to some of the noted shrines on these hills, which we shall now attempt to describe in the words of our journal which we hurriedly jotted down at the time.

Past the town of Sahasrām we came to a country which towards the west was covered with a dense forest of palm trees, whose tall trunks and elegant crests stood in bold relief on the twilight heaven—silent like so many sentinels by the huge ramparts which projected from the neighbouring hills. The south and the east were blockaded by a barren belt; a solitary palm-crest on the top of the ridge standing up prominently as a flag-staff; while the view was bounded on our left by a huge pyramid, on whose top the white tomb of Chandan Sayyid caught the eye as a relic of art amidst everything that was nature's own. Our tent had been sent up the Koṭā ghāt, and we thought we would have early rest. But scarcely had we gone a mile when a man came down from our pioneer, to tell us not to attempt the pass. We were advised to go to Tilauthū, where, we were told, a competent guide could be had. We were thus compelled to change our program at a moment's notice. Tilauthū lay eleven miles off, and changing our cart for an elephant, on we went at a sluggish pace until we reached the pass of Tārā Chandī. Tārā Chandī lies at a short distance only from Sa-

* This story of Harsha Brahma, taken from a poem in Hindī, called *Brahma-Muktāvālī*, by Isvari Datt Paṇḍit, serves as one of many instances to refute the overbold assertion of Buckle that "the tendency of Asiatic civilization was to widen the distance between men and their doities", and that "hero worship or deification of mortals could form no part of the ancient Indian Religion". Vol. I, pp. 142-146.

† Chyāpur, during the Mughul period, was attached to Rohtās as one of the domains of the keeper of that Fort. Subsequently it was held as the zamindārī of the Rājās of Bhagahanpur, one of whom in a fit of desperation killed the nāzīr or court officer of the Shāhābād collectorate, who was sent to serve a process on him. The zamindārī was, about the year 1790, confiscated for the offence.

hasráṁ, and presents the only opening to cross the chain. There is a small pool on the right side of the pass which retains water over gigantic layers of stone. On the left there is a shrine of Tárá Chandí, an image covered all over except the face, which is plated with silver. The pass is rough, and we went up and down over a wild country until we came to a deep stream, the banks of which were covered with bushes, affording splendid shelter to game. Two miles further on from Tárá Chandí, we came across the stone quarries which have supplied material for accomplishing that giant's work, the anicut across the Son, a dozen miles off. A light railway runs up to the foot of these hills, and although rail and labour had been at work for years and the gigantic Son has been dammed by a stone wall thirty to forty feet wide and near three miles long, how little, how very little, of the corner of the hill has suffered by continual cutting! How rich indeed is the stock of nature! From the quarries we turned to the south, and proceeded along the base of the chain, which appeared higher the more we advanced towards the south. At places where the summits rose high, we were deceived many a time by the prominent walls of stone which from their erect, slender, and rounded layers presented the appearance of some crumbling bastion or ruined fort. Forts they are indeed, and may be so to those who know how to use them, reared not by man, but by nature! From these heights towards the Son, the country is an even plain, well wooded with the bar, pīpal, mahuá, and the mangoe, and cleared at places for the wheat, barley, and, thanks to European energy, the blue dye or indigo. The road we took to Tilauthú appeared well-frequented. Traders and carts, equestrians and pedestrians, bullocks and tats, trotted up and down towards Arah and Palámau, and it will surely be a good thing to improve the condition of this ancient route. Such as it is, dusty and rough, we followed it up until we found ourselves in a nice shady plain, where the neat turrets of a well-finished Maṭh were the most pleasant object for the eye to rest upon. The turrets rose from amidst a mangoe tope on the one, and a well cared-for orchard on the other side. Four temples of the Banáras type reared their spires in the four corners of a square court, and one over a gateway towards the north, enclosed by straight plain walls. In the centre of the court stands a huge and higher temple with attached turrets round the main spire. Below the turret, the temple is surrounded by a square veranda projecting from the main building, and resting on elegant pillars and arches of slate. This is a peculiar type of temple structure, which is much adopted by the Jains in this district, and adds both to the strength and beauty of the buildings. The pillars are short with twelve flutes on each, and are overlapped both at base and the capital with ornamental neatly cut foliage. The coilings are made of broad stone slabs of a length of about 12 feet each.

We halted at this temple for refreshment. The fare offered was poor enough, but the priest was good-natured, and, to humour us, recited a verse to the effect—

“That there was no harm for the Eastern people (Bengali) to take fish.

“There was no harm for the people of the Deccan to marry their daughters to nephews.

“There was no harm for the Western people to drink water from leather bags.

“And there was no harm for the people of the north to eat buffalo meat.” This authority, however, came an hour too late. To collect information as to the best way of getting up to the hill, to visit the shrine, and to get at the inscriptions of which we had heard, but which nobody could precisely tell us where to find, were matters of anxiety. An old policeman, born and employed in the neighbourhood, at last offered to show us both the shrine and the “letters” around it.

It was the shrine of Tutturâ Bhavâni. Tutturâ Bhavâni lay five miles off, and as soon as we could be ready, we trudged on wearily along a sandy road stretching to the south-west. Amidst everything that was wild we were delighted to observe the broad clearings in the jungle, decked with the crops of the season—oats, wheat, barley, and the handsome poppy, and to contrast the bleakness of the hills with the result of human energy, which has turned the wilderness into fields of lovely green. Past this plain we found ourselves near the shrine. With the sun in front and a bed of innumerable stones scattered under our feet, we walked on wearily until the bluish haziness faded away, and we got a full view of the glen. It is a most secluded and wild spot, formed by the receding curves of two stupendous ridges, narrowing in from the north-west and south-east: their steep arms have raised a barrier which casts a gloomy shade, and makes it twilight long before the setting sun goes to his western bed. The summits of the two ridges slope down nearer 200 feet before they join. But from where they join to the foot of the glen, some 400 feet in height, the rock is one upright wall of sandstone. The edge of this wall has been washed for unknown ages by a waterfall which, during the rains, dashes down in a huge torrent. The surging of the cataract has of course dug a huge tarn below, which is deep, and retains limpid water all round the year.

“A lofty precipice in front,

A silent tarn below.”

During the autumnal months when the sky is serene, the hills stand in their rich mantle of deep blue and green, and the sun shines clear over head, this water-fall appears like a blazing column investing the chain with a splendour which the eye could never be tired of gazing. We gazed upon it but once at a distance across the Son, and ever since, we had been anxious to know what the place was like. The water, which spills out into the pool

during the freshes, flows forth in abundance through the adjacent country. The sound and fury of the cataract keep the people in the plains sufficiently awake. The fall of a stone or boulder over night when washed down from the hill to the pool, fills the heart of the timid peasant with awe. The waters at times flood and spoil their crops, but beyond these sad effects to how little good use are they brought? With comparatively little effort on the part of man, could not the dry vale be turned into a luxuriant lake, to serve as feeder to irrigation canals? But as the case with her history, so it is with her physical resources: in India nature and man work in silence in their accustomed courses of evil, without awakening a thought or making "the pulse beat one stroke more or less." The outside world is indifferent. To subjugate nature to the uses of civilised life, is a task which we have never been taught to accomplish, and while a waterfall only 150 feet in height on the opposite side of the globe has taught the Indian youth to talk with wonder of the falls of Niagara, this grand water leap of Tutalâ, nearer our homes, from at the least twice that height at the period of the rains, passes unknown, unmarked by the geologist, unnoticed alike by the engineer and the painter of natural scenes. The historian, who loves to dive into the depths of antiquity, never dreams to see what this spot is like.

But to the scene and the shrine. The shrine stands on the precipitous wall between the edge of the projecting cataract above and the gulf below. From the opposite bank of the pool the shrine appeared like a red spot on the breast of the precipice. To climb up to it was a hopeless task, we thought. But winding round the eastern bank of the pool we saw stones sufficiently broad to permit us to ascend or rather scramble up. So up we went, on all fours at times, leaving boots aside, until we found ourselves more than 125 feet above the water's edge of the pool below, and over 300 feet beneath the cataract, and face to face with the goddess Bhavâni. The niche of the idol is a curve in the rock, sloping below and projecting about a foot and a half above. From this projection the hill rises 500 feet straight up, forming on each arm a stupendous curve of a high rocky wall, from the top of which the fleeting clouds seem hardly a stone's throw apart. It was awful to behold the projecting precipice above threatening to hurl and sweep one down to the gulf beneath. From this recess there is but one opening which displayed the country towards the north-east.

The shrine is hardly in keeping with the grandeur of the scenery around. It speaks well of the poetical temperament of the Hindu; a better site could hardly have been selected to excite religious feelings, or to hold an annual fair. The idol is small and poor. It is an image in stone of the great Bhavâni, hardly two feet in height. The eight-handed goddess stands armed in her usual triumphant posture over a

lion under one foot and the fallen and cleft Mahisāsura under the other. The stone out of which the image has been cut is rough sandstone. Placed as it was in a secluded spot, it did not, however, escape the ravage of the intolerant Moslem. The story of Kāsim Khān, the Kālāpahār of these hills, who broke the face and broke as many arms as he could, and threw the idol down the rock, is still told in mournful language. Great satisfaction is, however, derived from the fact that ruin has already seized the ruthless family of this faithless Pathān, and not a soul is breathing now to commemorate his name.

Above the slab of the idol, which is cut in half-relief, there is an image of Nārāyaṇa, engraved or incised in the rock itself. On both sides of these images there are inscriptions cut in a character which differs from the Devanāgarī of the present day, and their language is a corrupt Sanskrit, which is scarcely intelligible. These inscriptions bear the date 1224, Samvat, = 1171, A. D. The records are consequently 706 years old. The rock and the inscriptions have a lamp black colour, probably from the smoke of the fires which are lighted at times for *homas* and sacrifices. The inscriptions are, however, legible.

The first commemorates the reign of "Nāyaka Śrī Pratāpa Dhabala. The youthful, long-armed Pratāpa, protector of the people, of handsome countenance, bright as a garland of innumerable suns, the great Lokapāl (supporter of men), lovely as Cupid, owning strongholds of three and nine apartments or gates, a worthy son of the Solar Race, who acquired his kingdom on Sunday the 4th day of the waxing moon of the month of Jaiśṭhya in the year of Samvat, 1224; who was mighty, honoured by the strong, a disciple of Kārtikeya (given to war), a source of pleasure to his chaste queens. The Prince was the son of a wreath-bedecked and learned king, who was always acknowledged even by the chief of the Devas (Indra) before his envoys."

नायकश्रीप्रतापधवलदेव सम्वत् १२२४ ।

• नायकश्रीप्रतापधवलक्षाना कुलरत्नः कुमारश्च आम्नस्तु श्रीशेखरी ॥ तिष्ठत्य नववर्षः ॥
लक्षादित्यः पद्मादित्यश्च ॥ समयज्येष्ठसुदि ४ रवौ सराजा जग ॥ १ ॥

वेदितुद्मानवेदितवर्कमावेत्स खाली वादिवृकी वेषकर्त्री ॥ नायकसुपुत्रवर्कस्य गृध्रः ॥
वीरवताः ॥ प्राज्ञः सवलः ॥ खामि कार्तिकेयः सतेत्यज्ञादयः ॥ कायस्य श्रीकुसुमस्य
हारस्य पुत्रः अजयन, विशायन उन्न श्रीद्वराजप्रतिष्ठापितगतः ॥

It was dark before we could get copies of the inscriptions and leave the glen. Hardly had we left the range, when deep darkness overtook us. On our arrival at the temple we found our men and traps had been thrown out of the building. The obstinate priest, we were told, would not allow us to stop inside during the night. This was no satisfactory news to be told after a long day's fatiguing ramble. We went inside. Sweet words

we found would be vain. So we resorted to a stronger argument. The math was instituted for charitable purposes. We were guests whom the priest was by duty bound to shelter. Neglect on his part, we observed, would be a serious dereliction of duty, and he would see to his cost that another man would soon succeed, if he further continued to argue. This had the desired effect. A change came over the spirit of the priest, and he was all humility and charity again.

We rose early, or rather mistook the moonlit night for dawn, and went on looking on the silent hills and the twinkling stars until the faint dawn broke in. We felt the incense of the morning refreshing and inciting us to repeat—

“Will not man awake and springing from his bed of sloth enjoy this cool,
This fragrant hour, to meditation due and sacred song?”

But our meditation was rather roughly disturbed as we turned round and spied a huge black brute passing in front of us. “Is this a boar?” Our stout companion of a chaukidâr said, “A bhâl only”. But before I turned again, Master Bruin was far away, and we regret we did not see more of his bearish majesty. A few minutes trotting up and down brought us back to the rough pass of Târá Chandî.

The sun was just up, and we enquired of a nymph dressed in ochre-coloured clothes, and who appeared to be the keeper of the shrine, if there was any writing on the rocks. She went into an adjacent cave and pointed it out to us. The cave was still dark, and we had to obtain a lamp from the priestess. The cave faces the south, and is at the extremity of the ridge which breaks in at the Pass. This is the only Pass which affords any thoroughfare to the country which lies east of the range. The country is well defended by nature. It is a cart-shaped tract, having the hills on the north and west, and the broad Son on the east. This secluded country, whose breadth varies from two to twelve miles, appears from the inscriptions to have been the principality of a Râjpût chief, who was also the lord of the strongholds on the hills, before the Moslem banner was hoisted on them. The name of this chief was Pratâp Dhaval Ail, of the order or gotra of Parsâ Râjpûts. He was a great worshipper of *Saktî*, and, having founded the shrines of Bhavânî in the glen of “Tuttalâ” and of Tripurâ at the waterfall, built up a third for Târá Chandî at the only pass through which his dominions could be approached from Sahasrâm and the open country. The cave which adjoins the shrine, is enfaced with a masonry wall, in which there is one door. A veranda fronts this wall, and rests on a row of slender stone pillars overlooking the pass. The cave has therefore one artificial and three natural sides, although the side walls are partly made up of masonry, to make the room rectangular. In the rear wall or rock, there is a

huge block, apparently engaged to the rock. It is more than two yards long and a foot and a half broad. Placed under a roof and surrounded by walls, it is rendered secure from the beatings of the weather, and therefore from decay. A long inscription has been cut on this block, which is completely legible. It is dated Samvat 1226, or 1173 A.D., and was carved under the auspices of a monarch immediately before the approach of the Crescent. The inscription consists of two parts. The first has two slokas in praise of the goddess of the shrine, and runs, if we are rightly informed, in the *Upendravajra* metre. The second part has three couplets and a half in the *Srag-dharā* metro, and recites the praise of the "stout and hard-hearted monarch Mahārājā Pratāpa Dhavala Ail, who was lord over rājās, owned a country and a fort, whose dominions extended 684 square miles on each side as ascertained by actual measurement by the hand. The Mahārājā was a Kshatriya of the Parsā gotra. He had the surname of Ail, and was of the same noble race as Rohitāśva, whom tradition assigns to have been the founder of Fort Ruhlās or Rohtās, and the first Aryan settler on the Son. He reigned in the same country as far back as 35 centuries. Was Pratāp Dhavala Ail, of whose existence, race, and name we have a tangible proof in the shrines and inscriptions, a descendant of Rohitāśva, to whose age the researches of History have yet hardly descended? It is difficult to doubt this. "For among the noble houses of the nations of the earth there is none that can boast of a longer pedigree, or of a more splendid history, than the Rājputās of India."*

We next visited the Mundeśvarī hill, on the summit of which there are the remains of a very ancient shrine. The hill is situated about six miles to the south-west of Bhubun. At the foot of the hill, an annual fair is held on the night of the 9th of Baisākh, when streams of pilgrims with flaming torches wind up the slope. From a distance the Mundeśvarī hill looks like a blue-pointed pyramid with the slight outline of a spreading tree on the summit. The tree grows on the ruined tower of a temple, the sides of which only are now standing. The approach to the temple lies through the eastern face of the mount. The ascent is easy; stage by stage as you ascend, the hill is observed to consist of three or four successive spires. Between the foot of each spire and the one immediately under it, there are even plains, which were once the sites of masonry buildings. The ruins of these are spread along the eastern slope with some huge images of gods. The chief of these is a big image of Ganeśa, richly ornamented. There is another image lying flat on the rock. The head is broken and is missing, but it has a coat with

* According to Mr. Sherring, (p. 143) Rohtās on the Son was founded by the Kachwāha or Kushwāhu tribe of Rājputās, who trace their origin to Rāma through his son Kush. Mahārājā Nala, Mahārājā Mān Siñha, and the present Mahārājā of Jaypur, are the present illustrious descendants of this race.

skirts hanging down to within two inches of the knee, a pair of boots or buskins, a girdle, and a sword-belt hanging towards the left.

The chief interest of the place is, however, centered in the temple on the highest point of the hill. The spire of the temple has fallen, and its sides are partly buried in debris. But its cornice is visible, and it is supported on a frieze, consisting of a nice range of tiger-heads. The fierce eyes of these faces rather ill-assort with the moustaches twisted up to a point over stretched and slender lips which give them altogether a grotesque appearance. The front paws are also visible, contracted to the point of a start.

All the doors of the temple, except the northern one, have been blocked up by the debris of the fallen porch. The square at this door is nicely carved, and entering through it we come to the shrine. The shrine is an octagonal spire, supported in the middle by four pillars with the same number of sides. The roof above consists of big stone slabs. Within the four pillars there is a standing block representing the phallus or Siva, but it has the peculiarity of having four faces carved on its four sides, looking towards the four doors of the temple. The temple itself appears square outside, but the walls have been thickened to an octagon inside. The eastern recess of this thick wall is occupied by a handsome equestrian statue of the goddess Mundalesvari. She rides triumphant on a buffalo, in the attitude of a man, and holds fast with her left hand one of its horns, to restrain the brute. Her ornaments are rich—richer is her hair, which is turned up in the shape of a nice chignon. Altogether the sculptor has succeeded in imparting to her face a vigour which is not usually observed in figures in old Hindu temples. Indeed, the great peculiarity of the images on the Mundeśvari hill is the elongated oval cut of the face, which contrasts with the square flats of the Orissan artists.

There are different slabs on the slopes in which inscriptions may be found. The letters are peculiar, neither resembling the Devanāgarī, nor the Pāli. But the most remarkable among them is to be found on a tongue of the hill, appropriately known to the natives as the *Jibh Devī*. Westward from the summit, the descent to this tongue lies over precipitous boulders, the crevices having thorny plants and poor grass. Going down the hill we came to this projecting rock, the so-called *Jibh Devī*, about 16 feet broad, protruding like a tongue about 30 feet from the hill. There is a broad crack at the point of projection over which one has to leap. It overhangs a wild country, bounded on all sides with wilder hills, and overlooking the plains some 300 to 350 feet deep. Over this narrow slice there are devices of plants and leaves. Inscriptions run across these plants, and they may well deserve the patience of the antiquarian. The letters are, however, so few and detached, that the information

they are likely to give, may ultimately turn out to be of little use. There is no doubt, however, that the pointed letters, some of which resemble the V and E of the English alphabet, must belong to a very ancient age, and it would be interesting to trace the people who engraved them. The letters are big and deeply cut.

Tradition attributes the rocks on the Mundésvári hill to a Daitya, by the name of Munda. He was the brother of Chanda, the chief who founded Chyápur. They belonged to a race of Pre-Aryans, who must have latterly blended their own worship of the phallus with that of the Sakti. The remains of their forts and stone buildings incontestably point out that the Daityas, who at times established sovereign sway over the Aryans, were not mere savages. Hated and dreaded as their names may appear, they were certainly powerful princes who represented a more advanced state of civilization than history has yet been ready to assign them. The history of these primitive races, detested by the names of Dákas, Daityas, Dasyus, the raw-eaters and the "Black race", remains yet to be written, and in the relics of their ruined forts, temples, pillars, scattered along the plains and hills of Sháhábád and the valleys along the Ganges, some material may be gathered to show that they were not entirely men of that degraded condition in which their antagonists have invariably depicted them. Mr. Thomason's remarks regarding the Bhar tribe equally apply to the other aborigines of the district: "They were a powerful and industrious people, as is evident by the large works they have left behind them."

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*Note on the old Manipuri Character.*—By G. H. DAMANT, C. S., *Officiating Political Agent, Manipur.*

(With two plates.)

' There can be but little doubt that this alphabet is a form of the Devanágari, and it was in all probability introduced from Bengal along with Hinduism by some wandering sanyási in the reign of Charairongba, who flourished about 1700 A. D.; at least there is no evidence to show that a knowledge of writing existed among the Manipuris at any earlier date. The earliest MS. I can find, purports to have been composed in the reign of Charairongba, and there are no mural inscriptions of old date in the country. The alphabet is singularly ill-adapted to the Manipuri language, and in point of fact, we find in the MSS. that the letters *g*, *gh*, *chh*, *j*, *jh*, all the gutturals, *ñ* *d*, *dh*, *b*, *bh*, *ç*, and *sh* are seldom, if ever, used except in words of Bengali origin, *k*, *t*, *p*, and *ch* being used for *g*, *d*, *b*, and *j* respectively, while

w, a letter which distinctly exists in the Manipuri language, is unrepresented in the alphabet. Compound letters are seldom used or required. .

The most important MS. is called the "Tákhelgnamba", and contains an account of the wars between Pamhaiba, *alias* Garib-Namaz, [Gharib-nawáz] king of Manipur and the Rájá of Tiparah. The copy in my possession contains 45 leaves written on both sides.

The next in importance is the "Samsokgnamba", which is a history of the war between Charairongba and his son Pamhaiba of Manipur and the kings of Burma and Sumjok. It contains 36 leaves.

The "Lānglōl," a short MS. of ten leaves only, is a treatise on morals, intermixed with proverbs and maxims, and would probably be interesting as throwing light on the customs of the Manipuris before their conversion to Hinduism. The only other MSS. of which I have been able to obtain information, are the "Meiyānggnamba", an account of the wars between Manipur and Kachár, and the "Salkau", a treatise on cattle and the respect to be shown them. Of these two latter I have not been able to obtain copies. The above seem to comprise the whole literature of Manipur; but it is just possible that further search may reveal one or two other works. The MSS. are all written on a coarse, but very durable, kind of paper, with pens made of bamboo; paper blackened with charcoal on which they write with a soapstone pencil is also used. The character has now been almost entirely superseded by Bengali, and indeed but few of the Manipuris can read it. A national chronicle is, however, still kept in the old character by the guild of priests, 'maibeas' as they are called, in which every event of importance occurring in the country is regularly recorded.

The language of the MSS. is most difficult, being quite unintelligible to an ordinary Manipuri, while those who can understand it are very few in number. It is, however, interesting as being the oldest form we possess of the Manipuri and cognate dialects. In a practically unwritten language like this, for the very few writings which exist could never have affected the mass of the people, considerable variations in dialect must inevitably take place in the course of a very few years; but in the present instance the difference between the written and spoken language is so great, that it can hardly be accounted for in this way. Tradition has it, and it seems most probable, that the Manipuris are a conglomeration of several distinct tribes, and it may well be that these MSS. are written in the dialect of one of them, whichever may have been predominant at the time, but this is a question which can only be satisfactorily settled after careful enquiry.

I subjoin a copy of the complete Manipuri alphabet, and a facsimile with transliteration and translation of the first page of the "Samsokgnamba." The translation is little more than tentative, as the meaning of many phrases is obscure and doubtful, the Manipuris themselves differing very much as to their meaning.

*Translation.*

Hail O King, hail lord of heaven, hail *snake*\* king, slayer of kings, O mighty king, snake king at whose voice the people flee, who has performed the works of a king, who has conquered ten camps of Burmese, with body and soul I will sing of *Selbi*,† *Samsok*‡ and the villages conquered last month. Hail to *his*§ father, king Charairongba, who changed the names of the gods, who warred in Selbi and *Tekhau*,|| who subdued in war the *Lolloitha*,¶ who ascended the throne in the sight of all the people, *who was related to the Burmese*\*\* and brought the *Poerai*†† into connection with them. I will tell how his daughter Chakpa Makhau Gnambi the *lady*‡‡ of royal family was given in marriage. Tongtoi, the king of Burma, gave order, Go my servants, you Mayangkong of Selbi the wise, and you Tunglacha of Burma the mighty, go both of you to Poerai.

\* The word 'lairel' is still used to signify a snake. It probably refers to Pakungba, the tutelary deity of the kings of Manipur, which is said to appear in that form, small if pleased, and of great size if angry.

† Kubbo.

‡ Sumjok.

§ This refers to Pamhaiba, *alias* Garib Namáz, the son of Charairongba, who died at the commencement of the war.

|| Asám.

¶ Said to be a tribe of Nágás, but I cannot identify them.

\*\* i. e. by giving his daughter Chakpa Makhau Gnambi in marriage to the king of Burma.

†† The people of Manipur.

‡‡ The word I have translated "lady" is "Tampa", it is a title applied to females of royal descent.



*Are Kálidása's Heroes monogamists?—By G. A. GRIERSON, C. S.,  
Rangpur.*

I was much interested by an article by Prannáth Pandit in the last number of the Journal of the Asiatic Society on the "morals of Kálidása."

With reference to one head of his subject, "Polygamy," I venture to differ from him. He says (page 357), "It is noteworthy that it (polygamy) is never prominently brought forward in the poems, except in the case of the wives of *Daśa-ratha*." And again, further on, "The greatest of our poet's heroes are either monogamists, or may be taken to be so for all the purposes of his epic narrative."

Has he not with regard to ~~the~~ poems forgotten *Dilípa*, one of the very noblest characters in the *Raghuvansá*, who is especially declared to have had a numerous (I. 32) *antaḥ-pura-varga* or *zenána*. Moreover, though it is then said that he considered these wives of no value in comparison to *Sudakshinā*, *Dilípa* is at the same time distinctly said to have considered not only her, but also *Lakshmi* as his wife, and hence to have been at least a professed bigamist. Of course it may be urged that calling *Lakshmi* his wife was a mere figure of speech, but still the fact shows that according to *Kálidása*, his model *Dilípa* did not consider polygamy an objectionable practice.

Again *Agni-varṇa* in the nineteenth book, who, though not a reputable character, was undoubtedly one of *Kálidása's* heroes, can hardly be called a monogamist.

With regard to *Kálidása's* play-heroes, one, at least, viz., *Purúravas*, cannot be taken as a monogamist, "for all purposes of the epic narrative," or of the dramatic narrative either.

In the second Act of *Vikramávaśi*, *Nipuniká* makes him out offending his Queen by imagining her to be *Urvashi*, and calling her by her (*Urvashi's*) name यन्निमित्तं पुनर्भर्तात्कण्डितस्तस्याः स्त्रिया नाम्ना भर्ता देवायता ॥ This surely is hardly the act of a strict monogamist, especially as subsequently *Purúravas* marries *Urvashi* in the lifetime of his Queen.

The only other Dramatic Hero of *Kálidása* with whom I am acquainted,—*Dushyanta*, though undoubtedly possessed of an "affinity" for *Sakuntalá*, as every right-minded hero should have for the heroine, used to appear surrounded by Yaván women, with bows in their hands and wearing garlands of flowers.\* I know that the commentators say that these women were simply arm-bearers, but on this occasion there was no reason

\* वायस्यनृत्ताभिर्धेवनीभिर्बनपुष्पमाला धारिणीभिः परिहृतः, near the commencement of the 2nd Act of the *Sakuntalá*.

for their bearing arms, and even if there was, such a profession does not explain their carrying garlands at the same time.

As this passage is, however, liable to discussion. I now quote another in the same act (the second), which occurs just before the 43rd verse (M. W.'s Edition). The *Vidūshaka* says to the king, speaking of his longing for *Sākuntalā*, "Just as a man who is sated with dates may desire the tamarind, so your highness, slighting the jewels of women in your *Zenāna*, has fixed his desires upon *Sakuntalā*".\*

There is one more play by a *Kālidāsa*, which is by some ascribed to the author of the *Sakuntalā*—the *Mālavikāgnimitra*. The hero in this piece is certainly not a monogamist, in fact *Agnimitra* is represented as being "very much married" indeed. He has a first Queen *Dhārini*, and then a second Queen *Irāvati*, who is the chief villain of the piece. Not only are these both prominent characters, but the king, not satisfied with only two, finishes the play by marrying *Mālavikā*, which is the conclusion to which the whole course of events of the piece has been tending.

It thus appears that it can hardly be considered an accurate statement of facts that "the greatest of" *Kālidāsa's* "heroes are either monogamists or may be taken to be so for all purposes of his epic narrative." *Dilīpa* was a polygamist, about *Raghu* we know nothing, and the only great heroes of *Raghu's* line, who bear out the above remarks, so far as we can tell, were *Aja* and *Rāma*.

Every one of the dramatic heroes is a polygamist, and the subject of marriage, so far as it relates to one or to a plurality of wives, is not mentioned either in the *Ritu-Saṃhāra*, the *Megha-dūta*, or the *Kumāra-Sambhava*.

\* तथातःपुरस्त्रीरत्नपरिभाविनो भवत इयमभ्यर्थना

*On the Route between Sohár and el-Bereymí in 'Omán, with a note on the Zúff, or gipsies in Arabia.—By Lieutenant-Colonel S. B. MILES.*

(With a map.)

Having arrived at Sohár (صحار) on the 16th November, 1875, and visited the Governor Seyyid Bedr-bin-Seif Al Bú-Sa'idí, I requested him to be good enough to arrange for my visit to el-Bereymí, and Sheikh Ráshid-bin-Hamd, with whom I was personally acquainted, and who is a man of considerable influence in el-Dháhireh (الظاهرة), having been at one time Governor of el-Bereymí, was selected to accompany me. I could, however, only promise myself a hasty visit, as my arrangement with Captain Clayton, Her Majesty's Ship *Rifleman*, who had kindly given me a passage, was to meet again at Sohár on the 22nd. The Sheikh's preparations as regards camels, &c., were not completed until the next morning at 10 A. M., when we started with nine matchlocks of the Na'im and Mokábil tribes, and reached about thirty miles by nightfall, encamping for the night at Sahilah, (سهيلة) a village in the Wádí Jezze (وادي الجزي) belonging to the el-Kunúdí. The road, after leaving the belt of palm groves and cultivation outside Sohár, ran N. W. for an hour to 'Auhí, (عوحي) a little patch of date groves and gardens irrigated by a *felej*, and then turned west over a stony, gradually rising plain, covered with thin acacia jungle and underwood towards the hills. The Wádí Jezze, which we came to soon after, is here neither broad nor deep, being but a few inches lower than the plain, and barely distinguishable from it, showing that no great torrent ever rushes down it, but that after rainfall, which in 'Omán is rarely heavy, the water that is not absorbed by cultivation is sucked in by the porous soil on the way. Another hour brings us to the site of an ancient ruined town, attested by heaps of fragments of black rock lying in squares and ovals, which mark the foundations of houses, and by parts of ruined walls and towers on adjoining hillocks, covering altogether a considerable extent of ground. From the appearance of the foundations, the houses must have been on a small scale and of rude construction. No vestige of any edifice of architectural pretensions remains. At the present day the locality is uninhabited, and a place of more dreary and complete desolation I have rarely seen. My companions could not tell me the name of the site, their only traditional knowledge was that it belonged to the Persians in the time of ignorance, and that it was destroyed by God on account of the refusal of the inhabitants to embrace the blessed truths of Islám.

A little further is a dried up *felej* leading from the hills, called Felej-el-Súk, (فليج السوق), and also ascribed to the Persians. At 2½ P. M., we

came in sight of Sehlát (سهلات), a village picturesquely situated on the top of a hill, and having at a distance a somewhat imposing appearance, though a closer view dispelled the illusion. It belongs to the Bení Gheith (بنى غيث), a petty Hīnawī tribe, subordinate however to the Na'im. Here we rested for a short time while the camels were fed. The next village we come to an hour later is Mileyyenēh, (الميلينه) and our road henceforth lies in the bed of Wādī Jezze as far as Hail, (حيل) for we have now reached the foot of the hill range and commence a more steep and winding ascent. Just below Mileyyenēh, where the Wādī narrows considerably, is an arched aqueduct, of solid masonry that supplies a village, called el-Ghorák (الغراق), belonging to the Bení Gheith. I could learn nothing precise about this aqueduct, which is evidently of very ancient construction, from the Sheikh, the tradition as usual being limited to the fact of its having been constructed by the Káfirs before Islám. Here we were overtaken by a heavy thunder-storm, which soon drenched us through and made the rocky path too slippery for the camels to venture out of a walk; the sight, however, was very grand from the picturesque scenery around us; the dark blue hills of the back ground, streaked by deepest black ravines and gorges, and with ridge upon ridge of lower hills in front being lighted up here and there by the rays of the sun, now near setting, glancing through a rent in the dark heavy masses of clouds above us and showing a strange contrast of light and shade. It was some time after dark when we reached the groves of the little village of Sahileh, (سبيله) and here the Arabs having lost the path and nearly brought us to grief among the water channels and low walls of the plantations, we were fain to wait for a villager to light us with a torch to our camping ground. This place belongs to the el-Kunúd, and has two small towers for defence. The next day, starting soon after sunrise, we pushed off more rapidly and reached el-Bercymí at 7½ p. m. Travelling at first in a south-westerly direction, we pass after an hour an affluent on the right bank, called Wādī el-Súfán, (وادي السوفان) up which is a village of the same name, and then the Wādī Jezze, here forming a loop, we cross the 'Aḳabat Ḳumáshí (عقبه تماشي) to join it again. A few miles further S. S. W. brings us to Burj el-Shikeyrí, (برج الشكيري) just beyond which lies the village of Kán, (كان) memorable for a conflict between the Wahhábís and the Ḥadhramí troops of Seyyid Sa'id-bin-Sulṭán some sixty years ago, in which the latter were signally defeated with great loss, and which paved the way for the onward progress of these fanatics to Shinás (شناس), where they again destroyed His Highness' forces. A cemetery of the slain in the bed of the Wādī near Kán attests the severity of the contest there. The tower of Shikeyrí is on a peak some 200 feet high on the right bank, and is joined to another tower below by a stone wall. It was built for the special purpose of barring the progress of the

Wahhábís. After another hour and a half we pass Wádí Wásiṭ, up which lies a town of that name. Sheikh Ráshid was very anxious I should visit this place, as the Sheikh Suleimán-bin-Sa'id el-Shámisí was a great friend of his and a man of some importance. It lay, however, too much out of the road, and time was of consequence. The next place we reached was el-Khoweyrej, (الخويروج) a village of the same clan as Wásiṭ, the Showámis, (شوامس) a sub-division of the Na'im, and having the protection of a fortlet and two towers. The cultivation here was extensive and very refreshing to the eye in contrast to the drear and arid rocks around. The fields were neatly arranged in terraces on the right bank, advantage being taken ingeniously of every available spot of ground capable of production. They were well kept and evidently received much attention, irrigation being carried on by means of channels leading from the copious stream above. Contiguous to this is Ḥail, another large village, the two forming the most considerable settlement I met with between Bereymí and Soḥár. Ḥail has several towers, and on the opposite bank is el-Rabí, (الربي) a pinnacle rock about 200 feet high, on which is perched a tower surrounded by a low wall now crumbling away. The work is ascribed to the Persians, and the position is well chosen for the purpose for which it is said to have been constructed, namely, to serve as an outpost to protect the maritime plain from the inroads of the Bedouins. This outpost not improbably marks the limit of the grasp of the Persians in the age immediately preceding the introduction of Islám, when they are related to have held the sea-coast of 'Omán, the Arabs maintaining themselves in the highlands and interior. Two petty clans of the Na'im, the Rashídat and Ḥadídat occupy Ḥail, and are at enmity with their neighbours the Showámis of Khoweyrej and Wásiṭ. As may readily be imagined, quarrels among such very close neighbours are very bitter, and they are said to ripen every four or five years into a free fight, which is not terminated without bloodshed. In such cases the people of Ḥail have the advantage of being able to cut off the water-supply of those below by damming up the stream, which is a very effective punishment, and is generally instrumental in bringing hostilities to a speedy termination. At Ḥail the Wádí Jezze is joined by its confluent, Wádí el-'Abyeleh, (العبيله) up which the road now leads. The course of Wádí Jezze above the junction is short, and lies W. S. W. towards Kábil and Seneyneh (سنينه). A few miles up it is a steep pass, marking, as my Sheikh informed me, the boundary of el-Dháhireh. We rested a little while at Ḥail, and then continued our route, soon reaching more open and level ground with woody ravines and scattered herbage. The highest point of this pass is called el-Nejd, where the aneroids showed an elevation of 1,860 feet, the peaks of the range on each side rising above us 1,000 feet or more. On descending the other side, we reached after an hour the Wádí 'Ain, which runs like all other water-

courses on the southern side of the range in a south-westerly direction until its waters are absorbed by the thirsty desert. We now continue W. N. W. over an unbroken plain sparsely studded with acacias direct on to Bereymí. On our right lies el-Mahdhah, (المحضة) the habitation of the Bení Ka'b tribe, while to the S. W. the lofty isolated range of Jebel Hafít, (جبل حفيت) looming some 20 miles away, alone breaks the level expanse before us, and we stand on the border of that inhospitable sea of sand and waste that stretches without break or interruption for nearly 800 miles across the peninsula, and forms the greatest sand desert of Asia. The Bedouins of our party having remained behind at a watering place we had passed, we found we had been jogging on for some miles without them, and the Sheikh professed some apprehension lest we should encounter any of the 'Awámir Bedouins, who, he said, were constantly prowling about. It is customary in 'Omán, when moving from one part to another, to take a man or two as Khafír, or protector, from each of the more important tribes through whose country one has to pass. This applies not only to strangers, but also to any Arab passing through the territory of another tribe with whom his own are not in "saff" or league, when it is of course unnecessary. Sheikh Ráshid had not been able to procure an 'Ámirí at Sohár before starting, and hence his anxiety. We had another thunder-storm this evening, but not much rain. On arrival at Bereymí, I went to the house of Selím-bin-Mohammed, whose father, the Chief Sheikh of the Na'im tribe, resides at Dhank (ذناك). Our arrival was the signal for a general assembly of visitors, whom I soon tired of, and I therefore beat a retreat to another house outside, which was cleared for my reception.

Early the next morning, I set out to visit the fort, which at present is in the hands of Sheikh Hamd. I saw his house on the way, and as he was laid up with a dislocated shoulder from a fall off a camel, he sent to invite me in to take coffee. The house consists of two lofty rooms separated by an arch and with no furniture, but a carpet or two and an array of coffee pots; two or three damsels bundled out as I entered, but the fowls and goats that seemed to make up the complement of inmates, being less bashful, remained. The walls of the courtyard are loop-holed for musketry, and a rusty iron gun lies half-buried in the ground inside. It took some little time to get coffee ready for the assembly that had crowded into the house and filled both sides of the room, but when it was over, I took leave and continued my way to the fort. On reaching the gate, I received a salute of three guns, which put the ordnance *hors de combat* by dismounting them from their rickety carriages, and thus prevented any further expenditure of powder. I was then taken over the fort, and the objects of interest generally were pointed out to me with great readiness and evident pleasure by the Sheikh's nephew and his people. I was gratified by their civility, and

spent some time in looking over the place, the strength and importance of which in their eyes are by no means undervalued. The plain in which el-Bereymí stands being so level, the view from the upper towers is extensive and interesting, embracing as it does the whole of el-Jow, and enabling one to get a tolerably clear notion at a glance of the topography of the settlement. To the S. W., at a little distance off, lies Sedeyrí's house, erected many years ago by that Wahhábi Chief for his own residence. It was solidly built of stone, but was destroyed by Seyyid 'Azán in 1870, who disapproved of seeing so strong a fortified house so near the fort, and who required the stones of which it was built to repair and strengthen the latter. After leaving the fort, I spent some time in walking through the section of the settlement more particularly known as el-Bereymí. The dates had nearly all been gathered, and the fields were being just freshly sown for the spring harvest, except a few late fields of jowári, and the fruit season was over, so I did not see the place to full advantage, but the fields were neat and regular, and the orchards well cared for. Indeed, great attention is paid to horticulture throughout 'Omán, and at all the centres of population the 'Bostáns' are the great objects of interest. The houses in these settlements are seldom grouped together, but are scattered among the date groves; they are principally of mat and date leaf construction, and form perhaps the least obtrusive part of the landscape. A good proportion of the few mud houses was dilapidated and untenanted, and gave a general air of unsubstantiality to the place. The verdant appearance of this oasis, however, in which the tall and handsome foliage of the date is the predominant feature, is most attractive and refreshing to the eye of the traveller, and soon makes him oblivious of the drear and arid waste he has traversed to reach it, while the luxuriant vegetation, the sight and sound of running water, the almost entire absence of unproductive trees and plants, convey an impression of prosperity which is by no means borne out in reality. During the day several of the Sheikhs came to visit me at Sa'reh, (صعرة) and as they were communicative, I was glad of the conversation. Among those who came was Sheikh 'Alí-bin-Seif of the Bení Ka'b, who lives at el-Mahdhah; he was loquacious and lively, and was very solicitous I should visit his tribe and settlement, but it was unfortunately not convenient to do so, and I was compelled to accept his invitation for another time. He told me he had been to el-Riádh, having been taken captive by the Wahhábis in his youth and carried thither in irons. He believed they were 24 days on the road from el-Bereymí to el-Ḥasa, as they travelled slowly, and there was plenty of water on the way. Not having had time to visit any of the Bení Yás settlements in the morning, a messenger arrived from them inviting me to do so, but I was obliged to decline, as it was already time for me to be taking my departure. At the suggestion of Sheikh Ráshid, I re-

requested Sheikh Selim to furnish us with an escort to the limits of el-Jow, but as he proposed to accompany me himself the first stage, I accepted his company with pleasure. It was not without strong remonstrances and pressing invitations to stay a day or two longer that we were permitted to make a start, but we succeeded in doing so about 3 P. M., and in presence of an admiring crowd of boys and Bedouins, we left el-Bereymí at a brisk trot by the same road that we had come; the Bedóos shouting and singing and racing their camels at full speed in high spirits and evident delight at being on the road again, and already oblivious of the fact that half an hour before they had been sulky and disgusted at being told to collect the camels for the journey. After some miles a peak to our left, named Kaṭar, (قطر) was pointed out to me as having on the top the remains of a Persian settlement with trees, dwellings, &c., and said to have been occupied by them after their repulse at el-Bereymí. We passed Khaṭmet el-Shikla, (خطمة شكلة) a small village at 12 miles, and soon after observing a low reddish coloured hill some distance off very conspicuous among the other dark rocks, I told a man to bring me a specimen. Nearly the whole party started off, and returned with sufficient stones to fill a portmanteau. It was a red compact nummulitic limestone, and was the only block of the kind I noticed on the journey. It was just dark when we reached el-Khurús, (الخروس) a deep cleft in the rocky bed of the Wádi 'Ain, which holds a perennial supply of rain water. The Arabs were anxious to push on to Ḥail, another 15 miles or so in the dark, but I objected; wood and water were sufficiently abundant, and we soon had a good fire under way and suppers cooking. I noticed the men obtained fire from a spark by rolling the tinder into a ball with dry Arabs grass and swinging it round until it burst into flame. The dew to-night was very heavy, and my blanket was drenched by morning. The elevation of el-Khurús is 1,630.

20th.—Before starting I took leave of Sheikh Selim-bin-Mohammed, whose protection was no longer required, giving him a suitable present, and I may mention as an instance of the entire want of shamfacedness in the Arab in begging, that he came up to me quietly, after he had received his *douceur* from my *factotum*, to whisper a request for two dollars more. I insinuated he had already received what I thought was proper for him, on which he said, "Well, give me one, only one more dollar, and I will be satisfied." This man's father is Chief of one of the largest tribes in 'Omán, and he himself a man of much influence and consideration. We reached the Nejd two hours after leaving el-Khurús. The ground here, which for some extent is comparatively level, is well wooded with acacias, rhamnus, &c., and green with low brushwood and grass. It is visited in the season by the Na'im and Ka'b Arabs for pasturing their camels and goats. The mountain range we were crossing is, except in the valleys and water-courses,

where the *detritus* from the hills forms a little soil, remarkably arid and sterile, and is everywhere from Jebel Akhdhar to Ruús el-Jebál entirely unclothed with verdure, presenting one of the bleakest ranges it is possible to imagine. The large valleys contain a good deal of herbaceous, but very little ligneous vegetation. Among the trees and plants in the Wádi Jezze and in the plain beyond the range were noticed the rhamnus, screwpine, *samar* or acacia vèra, acacia Arabia, two oleanders, calotropis G., castor-oil, and colocynth gourd, two or three euphorbias, the wild lavender, a rush much used for making mats called *rasad*; the *marranneh*, (مرنح) the narcotic plant noticed by Palgrave; the rose-scented *shirkeh*, and much coarse grass in tufts.

At Hail, which we reached in three hours from el-Khúrús, and which is perhaps 35 or 40 miles from Bereymí, we halted for a short time for breakfast and to feed the camels, which were beginning to show symptoms of fatigue, for since the commencement of the journey we had been keeping up a jog-trot of from five to seven miles an hour, whenever the road rendered it at all practicable. Our dromedaries were all pretty good, and were as sleek and well-shaped in appearance as they were swift and easy in going. 'Omán camels are acknowledged the best in the world. The Sherif of Mecca rides none other, and last year he received a present of six from Scyyid Turkí, which were sent by sea to Jedda. They fetch from \$100 to 150, if very superior, but the ordinary ones run from \$30 upwards. Depth of chest is considered one of their chief points. The Bedouins of 'Omán sometimes take their camels from el-Bereymí across Arabia to Nejd and el-Hejáz for sale. In 'Omán, Arabs ride behind the hump, the saddle being very small with a felt and sheepskin over it. The camel's nose is not pierced, but a headstall with a chain nose-band and a thick camel hair rope forms the bridle. In Yemen, they sit in front of the hump, resting the feet on the neck of the animal, the saddle having a high pommel to give support. On leaving Hail, we entered the political boundary of Sohár, and proceeded down the Wádi Jezze by the side of running water, flowing at intervals, as far as Mileyyeneh; owing to the alternate porosity and rockiness of the bed, the stream rushes along at one place for some distance, then suddenly disappears to re-appear again as suddenly further on. Kán and Shikeyrí, Sahíláh and Mileyyeneh, are successively passed and left behind, until at nightfall we reached our halting place not far from Sehlát, where the road branched off to Jebel Gharábeh, a spot I was anxious to visit. During our march to-day we had been joined by two Sheikhs of the Na'ím tribe, who were taking two horses for sale to Sohár. One of these, a chestnut mare, was a very casty, well-formed, and pretty animal, and from the price put on her the Sheikhs seemed to have a very exalted idea of her value. We passed on the road several small parties of donkeys and camels laden with

dried and salt-fish going up to el-Bereymi, where the consumption of these articles is very considerable. The elevation of this place was found to be 850. The road we have been travelling lies almost entirely along the smooth sandy bed of the Wádís or torrents, and presents no difficulties of any kind to communication. For the first 30 miles or so from Sohár the road winds up Wádi Jezze, and for 10 miles more its confluent Wádi 'Abileh. We then cross the ridge of the chain, here very low and not exceeding 1,900 feet, while the peaks on each side reach about 3,000. On descending the other side, we find ourselves on the plain of el-Jow, which borders on the great desert. Though heavy in places, the road is quite practicable for guns, and I remember no place that would be likely to cause artillery more than an hour's detention. The mountain range that has been crossed is part of the chain leading from Rás Mosandim (راس مسندم) to Jebel Akhdhar, and divides the provinces of el-Dháhirch and el-Bátineh. The hilly district between these two provinces is styled el-Hajar (الحجر) by the Arabs, but there is no general name for the range that connects Jebel Akhdhar with Ruús el-Jebál. The water-sheds towards Ruús el-Jebál lie east and west, while lower down towards Jebel Akhdhar, they lie N. E. and S. W. Running water was met with by me only in Wádi Jezze from Hail to Sehlát, and then never more than a few inches deep, but there is no scarcity of water anywhere. The inhabited spots are irrigated both by canals drawn from the stream, and by wells. The rocks met with were mostly sedimentary, the principal being a very dark limestone and an argillaceous slate, the latter lying in great angles. The bed of Wádi Jezze is cut through a breccia containing fragments of granite, green limestone, quartz, and a beautifully variegated sandstone, and the breccia or conglomerate is penetrated in some places by masses of slate or shale. The range is very peaked and sharp ridged, and here and there the strata were in waves, appearing as if the rock had been at some period subjected to pressure. Throughout the whole route, the aspect of the country is extremely barren and sterile, and, as might be expected, is unable to sustain much animal life. The only wild animals, I noticed, were a few ravine deer and foxes, and birds were everywhere extremely rare. On starting the following morning, we proceeded down the bank of Wádi el-'Aweyneh (وادي العوينه) of the el-Mokábil, who occupy chiefly the upper part, where it is well wooded, and where running water is abundant. In an hour and a half we reached Jebel Gharábeh, (جبل غرابه) where, as I had already learnt from Sheikh Ráshid, who had been regaling me throughout the journey with the traditional lore of 'Omán, were situated the ruins of the citadel of 'Omán, the pristine name of Sohár, at one time the capital of the whole country. I determined here to take the opportunity of exploring these interesting and ancient ruins, which are probably not paralleled in 'Omán, and accordingly made a short halt for the

purpose. The hill is not high, perhaps 250 or 300 feet, but it is very steep and inaccessible, and there being no semblance of a road, I was glad to accept the assistance of the Bedouins, who are as agile as cats and clamber about the most difficult places with ease. Around the summit, which is irregular, are traceable the ruins of these fortifications extending perhaps for half a mile. The wall still stands in places, from two to six feet high, and it is possible to trace the outline of part of the buildings at the highest point, though the greater part are an undistinguishable heap of ruins. Along the line of fortification at intervals were small circular towers, several of which are still conspicuous. The thickness of the walls was uniformly about three feet, and they are constructed entirely of rough fragments of the rock of which the upper part of the hill is composed, *viz.*, a white oolitic limestone, cemented with clay, and I could detect only three places in which mortar had been used at all. These were an arch in the wall, the curbstones in the path that led down the hill and the water cisterns. One of these cisterns, of which there are two, is quite at the summit, and is in shape an oblong, constructed of round pebbles cemented and plastered with mortar. The other is oval-shaped and of similar construction. It is lower down the hill. Both these tanks are small and shallow, and in such good condition, that, if cleaned out, they might still be serviceable. There are no signs of wells having been sunk that I could see; indeed, the quality of the rock precludes the idea of such an experiment. Somewhat below the highest point is a low arch in the wall, built of selected stones cemented together, and was not improbably that of the gateway, as it is just over the road. There is one other arch in a tower still lower down, but it is made with long slabs placed together uncemented. Only a few yards of the roadway are traceable near the top, the rest is entirely obliterated, but it probably wound round the greater part of the hill. It was very narrow, and is faced at the edge with curbstones. It was at the extreme summit where the outline is best preserved, that the residence of the Chief or Governor probably stood, but to judge from the heap of stones *in situ*, the building was apparently of no great extent; perhaps a small stone house for the Chief and rude shelter for the garrison were all that was needed. From its position and strength, however, the importance of the castle is sufficiently apparent, and it was doubtless considered quite impregnable in those days of slings and bows, while it of course commanded the whole plain of Soḥár from hence to the sea.

According to the tradition of the Arabs, as related to me by Sheikh Ráshid and confirmed by Seyyid Turkí and others, the castle at Jebel Gharábeh, as well as the city of 'Omán, were founded by Julandá-bin-Karkar, (جلندا بن كركر) under whom the city covered a great part of the maritime plain lying between Jebel Gharábeh and the sea; but there is no doubt that

both the ruins of el-Gharábeh and the city are much anterior to the time of the Julandaïtes. Another legend related to me was of the daughter of Julandá, whose hand became diseased and withered, while the physicians were unable to apply any remedy. She remained thus for a long time, and at last decided to try the benefit of the sea air and bathing, after experiencing which for a short time she entirely recovered. The above tradition, it may be remarked, deriving the Julandaïtes from the 'Amáleķite Bení Karkar is opposed to the more generally received account, according to which they descend from the el-Azd of 'Omán. The 'Amáleķa properly derive from the Ishmaelite or Nejdean stock, as does also Sohár, the brother of Tasm and Jadis and the Eponymus of the ancient town. The Julandaïtes were a powerful dynasty in 'Omán, and for some time previous to the second advent of the Persians before Islám held dominion over el-Bahrein and the whole of the Persian Gulf. According to Ross' Annals of 'Omán, the Persians at the time of the introduction of Islám had possession of the sea-coast of 'Omán, while the Arabs had the interior. Moḥammed sent messengers to the two sons of Julandá, who then ruled in 'Omán, and these messengers alighted at Damsetjerd near Sohár, a fortified place built by the Persians. Julandá's sons, 'Abd and Jeifar, and the Arabs agreed to accept Islám, but the Persians, refusing, were attacked in Damsetjerd by Jeifar and compelled to quit 'Omán. This Damsetjerd I am inclined to identify with the ruins at Felej el-Súķ described above, and this is indicated, I think, both by their position and the Arab tradition attaching to the spot. The extreme antiquity of Sohár as one of the principal emporiums of 'Omán is shown by its identification with the ancient city of 'Omán, the capital of the country, which depends not alone on Arab tradition and authority, but is accepted by European writers, who see in Sohár the Omana or Omna of Pliny and Ptolemy.

The exact period, however, at which the town changed its name is a question more difficult of solution, and regarding which history and tradition afford no clue. The ancient history of Sohár is very obscure, as, though frequent references to it may be found in all ages, no good description or account of it exists that I am aware of. A short notice, however, by Ibn Mojáwir is worth quoting. He says:—"Sohár had 12,000 houses, and every *nákhodá* dwelt in a separate house, and the people used to draw their drinking water from the aqueduct. Some one told me there were 192 steel-yards for the weighing of merchandize between vendors and purchasers. The town was built of bricks, mortar, and teak-wood, and it became ruined, and the *jinn* haunted the castles around. Abú Bekr el-Bisrí informed me that the country belonged first to the kings of Kermán of the Seljúķ dynasty, then it was ruled by the el-Ghozz, and afterwards it became deserted and was destroyed by the Arabs." Some cultivated spots

are still to be seen near Jebel Gharábeh, but the only outward and visible sign of its former greatness remaining is the aqueduct Felej el-Mo'taridh (قلج المعترض).

This work, which is of good stone masonry, leads along the surface of the ground, with a gentle declivity from the Wádi Jezze in the vicinity of Húreh Bargheh, (حورة برغه) or Soḥár Peak as we call it, to the shore, a distance in a straight line of 14 or 15 miles, and is still distinctly traceable for the greater part of the way, disappearing at the outskirts of the present town. I noticed by the side of it more than one small cistern of exactly the same pattern and construction as those on Jebel Gharábeh. The modern town of Soḥár has for some years been in a gradually declining state. It has been described in the bright pages of Palgrave, but has still further decayed since his visit. In Soḥár proper, which lies between Rás Sellán (راس صلان) and the village of Soweýhereh, (سويحرة), the population is now only about 4000, including 400 Persians, a dozen Jews, who have been gradually decreasing in numbers year by year, and half-a-dozen banians; the bulk of the inhabitants here as also along the coast from Soḥár to Majis being of Persian and Belúch descent. The citadel, in which the Governor Seyyid Bedr resides, is a lofty, square, plain building, with a strong entrance and well defended by a moat; next to Soḥár Peak it is the most conspicuous object seen from seawards. From the roof an excellent view is obtained of the surrounding country, and a lovely landscape it is, the sea-shore being fringed with a belt of stately palm gardens and cultivation about three miles broad, while behind, the plain rises gradually, until broken up by the lower spurs of the lofty, dark, serrated range in the back-ground. In the second story of this house is the tomb of Seyyid Thoweyní-bin-Seyyid, but the room in which it stands has been bricked up since my last visit. It is remarkable that of the number believed to have been associated directly or indirectly with Seyyid Selim in his parricidal act, some nine persons, only two are alive, the rest having all, with one exception, met violent deaths. The town-wall is very dilapidated, especially the front towards the sea, and is now fast crumbling down, and there are no towers or bastions to it, but the moat is still kept clear on the land side. The circuit of the wall is about a mile, but a very small extent of the area inside is covered with houses, the rest of the ground being bare or occupied with date and other fruit trees. The market contains about forty shops, and is good and well filled, the fish market particularly; the fisheries on the Báṭinah coast being abundant almost to a miracle. The custom duties are 5 per cent., and the farm this year has been sold to a Persian for \$175 per month; but this is no gauge for the amount of imports, as foreign goods are obtained from Muscat, where they have already paid duty, and are consequently free from assessment here. Trade is said to be decreasing annually, and to be transferring itself to

Shargah, which is almost as easy of access to the principal customers as Sohár, the Arabs of el-Dháhireh and el-Jow, and where goods are cheaper, being imported thither direct from Bombay, and thus saving Muscat dues and re-shipment. Sohár has no harbour, nor even the slightest shelter for native craft, and is dependent entirely on its position in being able to tap the trade of Upper el-Dháhireh and el-Jow for existence, and should this source of prosperity be in part drawn off by rival ports, it must sink in time to the level of other towns in the Báṭinah. El-Jow, in which el-Bereymí lies, is the smallest of the six provinces of 'Omán, and is situate between el-Dháhireh and the Shemál. It is bounded on the south by Jebel Ḥafit, on the east by Khatmet el-Shikla and el-Maḥdheh, on the north by el-Shemál, and to the west by the desert. El-Jow is inhabited by several tribes, both Gháfirí and Ḥinawí; the former having been in the ascendant since the accession of Seyyid Turkí. The most powerful and the predominant Gháfirí tribe at present is the Na'im, which is divided into two distinct and about equal sections, each having numerous subdivisions, and numbers on the whole some 20,000 souls. They occupy el-Bereymí Proper and Su'areh, (معرة) and their possession of the fort enables them to overawe the whole of the settlement. Since the time of Seyyid 'Azán, they have been practically uninterfered with by the Muscat Government, but of course own allegiance to the present Sultán. The Na'im are at feud with the Bení Yás, who occupy part of el-Bereymí, and their hostility is interrupted only by occasional truces; collisions frequently occurring between them. Of the two sections of the Na'im one inhabits more particularly el-Jow and Bereymí, the other el-Dháhireh. They are of the more orthodox or Sunní persuasion, unlike the generality of 'Ománís who are Ibádhíya. The Chief Sheikh of the tribe is Mohammed-bin-'Alí-bin-Ḥamúd, who lives at Dhank, his representative at el-Bereymí being his son Selím. The principal Ḥinawí tribe at el-Bereymí is the Bení Yás, who formerly gained so much notoriety by their piratical exploits. The Chief of this tribe is Sheikh Zaid-bin-Khalífah, a man of strong character, and perhaps the sole individual in these parts possessing any real personal power and authority. He resides at Abúthabí, and there are four smaller Sheikhs subordinate to him residing at el-Bereymí. This tribe takes the lead on the Ḥinawí side in all dissensions between the Ḥinawís and Gháfirís at el-Bereymí, and during Seyyid 'Azán's reign held the predominant position here. The Beni Yás occupy the villagos of Jemí, Kaṭáreh, Heylí, (هيلي القطارة الجيمي) and the Wadí Mes'údí (وادي المسعودي) at el-Bereymí, and are said to have formerly out-numbered the Na'im, but this state of affairs has become reversed of late. The Gháfirí tribe next in importance to the Na'im, is the Bení Ka'b, which numbers some 15,000 souls, and occupies the district of el-Maḥdheh, which includes the mountain range and val-

leys between Wádí el-Jezze and Wádí Hatta. There are about 20 villages in this district, the principal of which is el-Maḥdheh, where the Sheikh 'Alí-bin-Seif resides. They are all irrigated by conduits drawn from the hills, and as the soil is the same, Maḥdheh produces the same kinds and quality of grains and fruits as el-Bereymí. There is no direct pass through the range from el-Maḥdheh to Soḥār between Hatta and el-Jezze. Other Gháfíri tribes are the Bení Kattab (بنى كنب) and el-Darámikeh (الدرامكة); and Hīnawí tribes are the Dhowáhir (الظواهر) which occupies el-'Ain, el-Dáúdí, el-Kharais, el-Mareyib, Sa'neh and Mo'taridh, (الخريس الداودي العين), and rank next in power to the Bení Yás and the 'Awámir. This last is a very large nomadic tribe, widely scattered over 'Omán, but occupying chiefly the desert outskirts from Kooria Mooríá Bay to the Sabkha, (صبخة) and roaming about with their flocks and herds in a state of semi-savagedom. The 'Awámir are genuine Bedouins, and no wilder or more predatory race exists, I believe, in Arabia. One of their clans, the 'Affár, (عفار) are popularly supposed to feed upon the bodies of animals that have died naturally, but this is denied by the tribe who, however, admit that they are not unfrequently reduced to devouring their skin clothing. A large portion of this tribe has settled down, particularly in the province of 'Omán, where they occupy a district of twelve villages called the 'Buldán el-'Awámir and follow agricultural pursuits. The wandering 'Awámir do not even respect the members of other clans of their own tribe unless they are acquainted with them, but plunder indiscriminately all they meet. In August 1874, a party of this tribe arrived at Muscat from the neighbourhood of Wádí Rekot in Kooria Mooríá Bay to assist His Highness Seyyid Turkí in an expedition he was engaged on, and returned afterwards, as they had come, by land. They professed to have no difficulty in making their way over the great desert.

El-Bereymí is the appellation usually applied to a collection of seven villages or settlements, of which the one, specially bearing that name, is the largest and most important. The others are Su'areh to the N., Jemí, Kaṭáreh and Heylí to the N. W., and 'Ain and Mo'taridh to the S. E.; and the population of the whole may be estimated at 12,000 to 15,000. From the outside the appearance of these settlements is very pretty and refreshing, the date palms and orchards forming a green-setting to the low palm leaf huts, which are scattered throughout, and which just peep through the foliage. They have a striking similarity to the "ábádís" or settlements in Mekrán. The general condition of the people is low, and there is a noticeable equality of property throughout, but this is owing probably more to the want of good government and the chronic state of warfare and insecurity they live in, than to the natural disadvantages of the land. Agriculture is in rather a mediocre state as regards cereals and vegetables, the principal object of culture being of

course the date. They are not dependent on the annual rainfall which is small, but are able to irrigate with certainty by means of their valuable aqueducts drawn from the hill range as well as from wells, water being abundant and at no great depth. Each settlement has at least one of these canals, that of el-Bereymí Proper being brought from a perennial spring in the hills distant about twenty miles. The water in this canal was quite warm to the touch, but I forget what they told me about the source. The grains grown are wheat, jowari, maize, barley, and bajri, the spring crops being wheat, the autumn, jowari, and bajri. This is sometimes succeeded by a crop of beans or pulse, but the latter are never sown intermingled with cereals. The stubble is always ploughed in and never burnt, and the only other manure used is cattle dung. The vegetables grown are sweet potatoes, radishes, cucumbers, egg-plants, onions, and pumpkins. Tobacco, cotton, red and white, and lucerne are also grown, the last for the use of cattle. Eight or nine crops of this are obtained in the year, showing the quality of the soil, which is fertile but thin. But more care and attention are bestowed on the fruits than on anything else, and they consequently arrive at considerable excellence. All the best kinds of dates are cultivated, *furd*, *mascybilí*, *khalas*, &c., though they are not considered equal to the same varieties in Bedich (بدية) and Semáil (سمائل). The other fruits are peaches, mangoes, custard-apples, limes, sweet-limes, oranges, mulberries, pomegranates, melons, guavas, figs, and grapes. There are only a very few horses at el-Bereymí belonging to the Sheikhs; cattle too are scarce; camels are abundant and cheap; and asses are used extensively for burden and riding. The food of the people is chiefly dates and coarse bread or rice, varied by salt-fish, camels' and goats' flesh. Milk is abundant, and a hard sort of cream cheese is made, the juice of an euphorbia being sometimes used instead of rennet for coagulating the milk. On the sea-coast the intestines of fish are often used for this purpose. There being no banians or other regular traders, there is no general bazar at Bereymí, but every afternoon a market is held where the Bedouins assemble with their produce and animals for sale or barter with those who can supply their wants. Money is little used on such occasions where cloth, articles of food, camels, donkeys, goats, and all the miscellaneous articles of an Arab household, are exchanged. The most trifling things change hands, and the scene is, as may be imagined, a lively and picturesque one. The ladies here, I observed, did not wear the tinselled mask seen in Muscat, but covered their heads with a black cloth veil, which is still more unbecoming. I must not omit that like their European sisters they wore high-heeled shoes. Their occupations, besides household affairs, are spinning, mat-weaving, felt-making, and tending goats and kine.

El-Bereymí formerly possessed two forts, only one of which is now

standing, the other has been demolished, and lies a heap of ruins. Both are said to have been built by the Showámis, a strong clan of the Na'im occupying chiefly the Wádi Jezze, but the fort still standing was improved and strengthened by the Wahnábis during their occupation. It consists of four towers joined by curtains and surrounded by a deep ditch. It is of square form, built entirely of mud or unburnt bricks, and carries eight guns of sizes. The breadth of the ditch is about 25 feet, and both scarp and counterscarp are quite steep and faced with brick work. The rampart is eight feet high and two thick, and there is an open space of 20 paces between it and the towers. These towers rise perhaps 40 feet, the curtain somewhat less than half way up, and each side of the square formed by them is about one hundred and fifty feet. The gate is the weakest part of the structure, there being only a single small wooden door standing half way across the ditch, which is here bridged with the trunks of two date trees. Inside the fort is a residence for the Sheikh with accommodation for the men, and some godowns. Water is abundantly provided by two wells, which would yield sufficient for a large garrison. I tasted the water of one, and it was perfectly sweet and good. Near the outer gate is a brass 24-pounder, mounted as a field-piece, having the name of Seyyid-bin-Sultán, A. H. 1258 in Arabic, and the English date 1842. It is one of a batch of 20 that Seyyid Sa'id procured from America at that time for his corvette the *Sultan*. This gun was brought from Soḥár by Seyyid 'Azán, in 1870, in his expedition against Bereymí, and was used against the fort it now defends. With unusual energy and forethought for an Arab, Seyyid 'Azán brought spare carriage wheels, harness, and tents, all of which are carefully stored up in a godown. The harness did not look as if it had ever been used, and they told me the gun had been dragged thither entirely by manual labour. The fort is fairly well situated, and stands out on the plain, but on the N. W. side the houses and cultivation encroach somewhat close upon it, and on the other side lie the ruins of Sedeyrí's fort at no great distance, which would afford capital shelter for an enemy. Both as regards strength and position it is the most important fort in this part of 'Omán, and is generally regarded as the key of the country towards the west. Its reduction, therefore, would be considered necessary by any force approaching from that side.

I endeavoured to gather information respecting the route between 'Omán and Nejd, but the accounts were somewhat discrepant. According to some the first district beyond el-Jow is Beinúneh, in which is el-'Ánkeh, a hamlet of the Bení Kattab, with a small date grove, the Sheikh of which is Sa'id-bin-Aweydimí. Next to Beinúneh lies el-Dhafreh, inhabited chiefly by the Menásir, and where there is a watered grassy vale called Da'fis, visited in season for pasture by the Menásir, 'Awámir, Bení Yás, Bení Kattab, el-Mizaniyeh, and el-Ghafaleh nomads. Further on between el-Dhafreh,

Kaṭar, and el-Ḥasa is the district of el-Ja'fūr. Through these districts lies the route from el-Bereymi to el-Ḥasa, from whence the road continues to el-Riádh. There is no tract that can be followed, as the sand is blown about by the wind, but there appear to be two general routes, one of which is used more in winter, the other in summer; the first is straighter and shorter, the other passes near the sea, is more winding, and after leaving the Sabkheh turns north for three days. The journey is not considered dangerous or difficult, as water is found in a great many places, though usually very brackish, and they seldom have to carry a supply for more than two days. Caravans very rarely make the journey, and travel only at night, taking about thirty days from el-Ḥasa to el-Bereymi. Troops as a rule travel by day only, their pace being a gentle amble, and they cover the distance in twenty to twenty-five days. A kásid takes ten days. The Menásir and Bení Yás chiefly hold possession of the eastern part of the route, the Al Morra of the western. No hills are met on the way, and the only Wádís are el-Sabkheh and el-Sohba. I give in a tabular form the halting stations of the two routes, but as already observed, water is procurable in many other places. The Sabkheh, or Sabkheh Mattí, as it is sometimes termed, is a marshy tract or Wadí about forty miles in breadth, commencing from the vicinity of Wadí Jabrín and entering the Persian Gulf between Long.  $51^{\circ} 50'$  and  $52^{\circ} 20'$ , lat.  $24^{\circ}$ . In some parts it is a treacherous morass, only to be crossed at the beaten tracks, and it is said that should the camel miss the path, he becomes engulfed in the mud. The Sabkheh, according to the concurrent testimony of all the Sheikhs and best informed persons I have spoken to on the subject, both in el-Jow and Muscat, including His Highness Seyyid Turkí, is the boundary line between Nejd and 'Omán, and has been so considered from time immemorial. The water-shed of el-Aarid and Yemámeh appears to lie S. E., the Wadí Hanífeh and all other Wádís converging towards el-Randha, where they unite in the Wadí el-Sohba, which falls into the Persian Gulf just above the Sabkheh Mattí, probably at Khor el-Dhoan. The Bedouins in the great desert rear great numbers of camels, the sale of which constitutes their chief support. The Al Morra and 'Awámir are said to traverse it extensively, as it is not entirely destitute of water, which can be obtained of brackish quality in places by digging. Palms and other large trees are not met with, but dwarf acacias and herbaceous vegetation, suitable for camel fodder, are sufficiently abundant. Besides two species of gazelle and the oryx, numerous ostriches inhabit the more northern and western portions, and are hunted for the sake of their feathers, which eventually find their way to Mecca, there being no sale for them in 'Omán. There is said to be a route running direct S. E. from Nejd to Mahra that takes twenty-five days. Water is procured every three or four days, and is carried on in skins, the

Bedouins finding their way without difficulty ; a light camel-load of dates and flour enabling them to traverse a long distance. In 1870, Sa'ūd-bin-Jelowí came straight across the great desert from Nejrán to Abúthabí in fifty-six days, travelling leisurely, but for the last fifteen days he and his followers were greatly pressed for food, their store having become exhausted. His purpose was to meet Seyyid 'Azán, which he did at Burka, and then accompanied him in his expedition against el-Bereymí.

South of Yemámeh and three days from el-Ḥasa lies the fertile and well-watered valley of Jabrin, whose groves of date palms are said to extend for several miles. It is situate entirely in the desert, and does not form part of Nejd. It was formerly a large and flourishing settlement, but it subsequently became so malarious and unhealthy, that the inhabitants were driven away, and it is now almost entirely destitute of permanent residents. The Arabs claim an antiquity of 800 years for it, but it has long since fallen to ruin, though I believe the fort and some of the walls of the houses are still standing. It is also said that after heavy floods gold coins are sometimes picked up by the Bedouins. The dates belong to the Al Morra and Dowásir tribes, who visit Jabrín in the summer to collect the harvest, which is carried for sale to Nejd and el-Ḥasa. It is also extensively resorted to by the neighbouring nomads with their flocks and herds for the sake of the luxuriant pasturage.

In el-Bereymí I found a small colony of Arab gipsies, Zaṭṭ (ط) or Zaṭúṭ, as the Arabs call them, settled and I have since had further opportunity of observing these people. In his 'Alte Geographie Arabiens' Dr. Sprenger has identified the Zaṭṭ with the Jats of India, and though, as he shows, they have been in Arabia upwards of 1,000 years, they are at once distinguishable from the Arabs as a distinct race. They are taller in person and more swarthy, and they have that cunning and shifty look stamped on their physiognomy so observable in the gipsies of Europe. The Zaṭṭ are spread over Central and Eastern Arabia from Muscat to Mesopotamia, and are very numerous in 'Omán. Everywhere they maintain themselves as a separate class and do not intermix by marriage with strangers. It occurs sometimes, I believe, that an Arab takes a Zaṭṭiya to wife, but no pure Arab girl would be given to a Zaṭṭ, though daughters of Arabs by slave mothers may occasionally be obtained by them. It is probable, too, that the race is continued to some extent by adoption as well as procreation, as they do not seem to be a prolific people. In 'Omán, besides those who have been permanently settled in the country, are to be found many who come across from Persia and Belúchistán in search of employment or to visit their kinsfolk, but their stay is seldom prolonged. The Arab Zaṭṭ are divided into numerous clans or families, for which they have adopted Arab nomenclature, such as Wilád Maṭlab (ولاد مطلب), Wilád Kābál (ولاد قبال), Wilád Shaghraf (ولاد

(شغرف), Musandú (مسندی), Ḥarīmāl (حريمال), Ḥaik (حيك), 'Ashorī (عشوری), &c., and each of which is in a state of clientship to some powerful Arab tribe, generally that of course with which it has most trading connections. The Zaṭṭ all profess the Musalmán religion, but no doubt they retain many of their own customs and usages. The levirate law obtains among them, but should there be no brother, the nearest male relative can take the widow to wife. They are looked down upon by the Arabs as an inferior race, but they are valued for the useful services they perform; and as their persons and property are always respected, they usually go about unarmed. In Nejd, I hear, the Zaṭṭ women are considered to be very handsome and dance publicly for money, but they are reputed to be chaste and moral; they are a necessary ingredient at private festivities, as they set off the assembly by their beauty and the party is not thought complete without them; they are consequently also more sought after by the Arabs there as wives. In 'Omán the case is different. The 'Omání women are more highly endowed by nature than their Nejd sisters, and the Zaṭṭ are not thought so favourably of by comparison. They appear to lead a semi-nomadic life, and move about from village to village with their families and chattels, working as occasion requires, but a few families may be found permanently established in most of the large towns and settlements. Their little mat hovels are the smallest and wretchedest human tenements I have ever seen, being merely a couple of mats arranged round three or four sticks tied together at the top, and the whole concern not usually exceeding 4 or 5 feet in height. They are accomplished handicraftsmen, being farriers, smiths, tinkers, carpenters, weavers, and barbers. They manufacture also guns and matchlocks; indeed most of the trades and manufactures seem to be in their hands, and they are to the natives of the interior what the Banians and other Indians are at the sea-port towns.

The Arabs assert that the Zaṭṭ speak among themselves in a dialect unintelligible to strangers, and they call this 'Rattíní' or 'Fársí'; but it is my belief that the original tongue of the Zaṭṭ has become almost entirely obliterated through long and intimate intercourse with the Arabs, and that what they speak among themselves is a jargon or gibberish of their own particular manufacture, composed of a corrupted Arabic mixed with the few Jat words they have retained. To effect this they have invented a simple and ingenious system by which they are able to transmute any word required into their own jargon without the slightest hesitation. The plan is to prefix the letter *m* and to suffix an additional syllable *eeh*, while lengthening the first or second syllable of the word itself. Thus Bard (cold) becomes Mbardeek; Kámar (moon), Mkámareek; Ghól (غول snake), Mgholeek. I subjoin a few words that appear to be of their own vocabulary, as specimens:—Father—Bweieek; Mother—Mahiktee; Brother—

Mânas ; Son—Kashkâshee ; Man—Fseyil ; Woman—Fseyileh ; Slave—Daugeh ; Head—Kerrâ ; Body—Kerrâsh ; Bread—Kshayim ; Rice—Fidâmah ; Knife—Jerrâha ; Water—Tsammee ; Donkey—Gyadoor ; Go—Batûs ; Child—Towâtneek.

The Arabs do not of course trouble themselves with speculations as to the origin of this people, but have a traditionary belief that they immigrated to Arabia from Persia at some remote period. I may remark, in conclusion, that resemblance between the Zatt and the Gipsies of Europe in character, appearance, habits, and profession (I have no means of comparing the languages) is so striking and complete, that the hypothesis of their identity of origin must be regarded as, at least, highly probable.

*A Route from el-Bereymí to el-Hasa.*

| Names of places. |    |    |                                                                 |
|------------------|----|----|-----------------------------------------------------------------|
| El-Dhafreh       | .. | .. | الظفرة                                                          |
| Khotem           | .. | .. | ختم                                                             |
| El-Serâdih       | .. | .. | السراديم                                                        |
| Bedú el-Motowwa' | .. | .. | بدو المطوع                                                      |
| Beinúnah         | .. | .. | بينونه                                                          |
| Bedú Jerash      | .. | .. | بدو جرش                                                         |
| Sabkkeh Mattí    | .. | .. | صبخة مطي                                                        |
| El-Sala'         | .. | .. | الساح                                                           |
| Salwah           | .. | .. | سلوة                                                            |
| El-Ghodha'       | .. | .. | الغضي                                                           |
| El-Sakik         | .. | .. | الصكك                                                           |
| El-Hemrúr        | .. | .. | الحمرور                                                         |
| El-Taraf         | .  | .. | الطرف                                                           |
| El-Hasa          | .. | .. | الحصه                                                           |
|                  |    |    | From El-Hasa, i. e., Hefûf, the usual road to Nejd is followed. |

*Another Route from el-Bereymī to el-Ḥasa.*

| Names of places.     |             | Quality of water.                         | REMARKS.                                                                                                                                                                                                              |
|----------------------|-------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| El-Johar ..          | البحر       | Wells of good water ..                    | Acacia jungle, but no cultivation. Belongs to-el-Dhowāhir tribe. Half a day from Bereymī.                                                                                                                             |
| El-'Ankah ..         | العانكة     | Good, from shallow pits..                 | Date trees and cultivation. Hamlet of the Benī Kattab.                                                                                                                                                                |
| El-'Aweyneh..        | العوينه     | Plentiful, but brackish; wells very deep. | Acacias and camel fodder. Two days from the sea.                                                                                                                                                                      |
| Bedā Showeybī        | بدوشويبي    | Brackish; wells deep ..                   | Barren country with scrub. Limit of Beintūnah.                                                                                                                                                                        |
| Da'fis ..            | دعفس        | Brackish; wells deep ..                   | Low ground with acacias, scrub, and grass. Visited in rains for pasture by el-Manāsir, Benī Yās, Benī Kattab, El-'Awāmīr, Mizārich, and el-Ghafaḥ nomads. Two days from the sea.                                      |
| Bīr el-Motowwa' •    | بئر المطوع  | Sweet; wells very deep..                  | Acacia jungle. This place is so-called from one Mōḥamed el-Motowwa'; a noted character, having been slain here. His son Ḥamd is now one of the most noted freebooters in 'Omān, and a constant terror to the Bātinah. |
| Ghadīr el-Lāl ..     | غدير اللال  | Sweet; but wells deep ..                  | Scanty scrub. The Sabkha lies between this and Bīr el-Motowwa'. Road level, but winding among sand hills.                                                                                                             |
| El-Sala' ..          | السلح       | Springs of sweet water on surface.        | Acacia jungle. Belongs to el-Menāsīr. Half a day from the sea. Limit of el-Dhafreh.                                                                                                                                   |
| 'Aḳlet el-Nakhlet .. | عقلة النخلة | Sweet, near surface ..                    | Among sand-hills. Belongs to el-Menāsīr and Al Morra.                                                                                                                                                                 |
| El-Satik ..          | السكى       | Sweet, from springs ..                    | Woody. Lies a little S. W. of el-Ḳaṭar.                                                                                                                                                                               |
| Salwah ..            | ملوة        | Sweet.                                    |                                                                                                                                                                                                                       |
| Ba'ij ..             | بعيج        | Sweet; wells five fathoms deep.           |                                                                                                                                                                                                                       |
| Bajāsh ..            | بجاش        | Sweet.                                    |                                                                                                                                                                                                                       |
| El-Menā'iet ..       | المناعية    | Sweet.                                    |                                                                                                                                                                                                                       |

*The Mo'allaqah of Lebîd, with the life of the poet as given in the Kitâb-el-Aghânî.*—By C. J. LYALL, C. S.

NOTE. It is proposed to publish a translation of the seven *Mo'allaqât*, or "Suspended poems" of the Arabs, together with a rendering into English of the notices of their authors contained in the famous *Kitâb-el-Aghânî*, or "Book of the Songs of the Arabs," by Abu-l-Faraj el-Isfahânî. The following version of the fourth *Mo'allaqah*, that of Lebîd, with its accompanying notice, is here printed as a specimen of the work.

The book will consist of four parts: I. An Introduction, giving a sketch of the history of Arabia during the century before the Hijrah to which the poems belong, a brief account of early Arabian poetry generally, some information regarding the mode in which the poems have been handed down and the early *râwîs* or traditionists to whom their preservation and illustration are due, together with an examination of the historical data afforded by the *Kitâb-el-Aghânî* regarding the lives of their authors. II. Translations from the *Kâmil-et-tawârîkh* of Ibn-el-Athîr and the *Kitâb-el-Aghânî*, giving the history of the Wars of Basûs and Dâhîs. III. Notices of each of the seven poets (except Tarafah, who is not mentioned in the work) translated from the *Kitâb-el-Aghânî*. The account of Tarafah will be filled in from extracts from Ibn Quteybeh and others supplied by Reiske's edition of his *Mo'allaqah*. IV. Following each notice, a translation of the poet's *Mo'allaqah* in English prose, line for line with the original. Parts II, III, and IV will be illustrated where necessary by notes appended.

The renderings of the poems will be taken from the text of Arnold (Leipzig 1850), those of the *Kitâb-el-Aghânî* from the Bûlâq edition (in 20 volumes) of that work, and those of passages from the *Kâmil* from Tornberg's edition.

It is hoped that an accurate translation of the most ancient and authentic poems of the Arab race—poems which have for ages been regarded with the highest admiration as models of style and composition, and which undoubtedly present a fresh and faithful portraiture of the people among whom they appeared—illustrated by the oldest and most trustworthy traditions regarding the circumstances under which they were composed and the valiant stock to which their authors belonged, will not be found unacceptable.

The system of transliteration applied to Arabic words when they occur in Persian and Hindustani which has been adopted by the Asiatic Society, though well suited for the purposes of those languages, is not appropriate when the object is to represent in English Arabic words as uttered by Arabs. In the following pages, therefore, a system has been followed which is believed to agree closely with the best standard of pronunciation current in Arabia; it is mainly that adopted by Mr. E. W. Lane in his great Arabic-English Lexicon, the only differences being that among the consonants **ج** is represented by the old-English **Ḍ** (with which it exactly agrees), **ظ** by **Ṭ** (to mark clearly its relation to **ض** **Ḍ**), **ق** by **Q**, homzeh by ' , and **ع** by ' , and in rendering the vowels the circumflex instead of the acute accent has been used to indicate length, and **ê** and **â** substituted for **ee** and **oo**. In the use of the *imâleh* of the *Fethah* (giving the vowel **a** the *e*-sound) and the *Dammeh* (change of **u** to **o**) an endeavour has been made to follow as closely as possible the rules laid down by Mr. Lane in his paper at pp. 171—186 of the 4th volume of the *Zeitschrift der Deutschen Morgenländischen Gesellschaft*.

## Lebid.

(Kitâb-el-Aghânî XIV. pp. 93—102.)

Lebid was the son of Rabî'ah son of Mâlik son of Ja'far son of Kilâb son of Rabî'ah son of 'Âmir son of Şa'sa'ah son of Mo'âwiyeh son of Bekr son of Hawâzin son of Manşûr son of 'Ikrimah son of Khaşafeh son of Qeys son of 'Eylân son of Muḍar. His father was called *Rabî'at-el-mo'tarrîn* ("a Spring to those who came to ask for his bounty") on account of his liberality and generosity: he was slain by the Benû Lebîd in the war which befell between them and their tribe and his people. His uncle was Abû Nizâr 'Âmir ibn Mâlik *Mulâ'ib-el-Asinneḥ* ("the player with lances"), a name which he gained from the verse of Aus son of Ḥojr—

" 'Âmir played gaily with the points of the spears,

And the fortune of the whole host betook itself thereto."

The mother of Lebîd was Tâmirch daughter of Zinbâ' of 'Abs, one of the daughters of Jeḏimch the son of Rawâḥah.<sup>2</sup> Lebîd was one of the poets who are counted as belonging to the Ignorance, and also a *mukhaḍ-rim*, or one who attained to the days of el-Islâm; and he was one of the noblest of poets who composed faultless verses, of good knights, of reciters of the Qur'ân, and of those who attained to long life: it is said that he lived a hundred and forty-five years.

Aḥmed ibn 'Abd-el-'Aziz el-Jauharî states in his traditions respecting Lebîd's life, on the authority of 'Omar ibn Shebbeḥ, who heard it from 'Abd-allâh ibn Moḥammed ibn Ḥakîm, and it is also asserted by el-Ḥasan ibn 'Alî, who was told by Ibn Mahraweyh, who heard it from 'Abd-allâh ibn Abî Sa'd, who heard it from 'Alî ibn eṣ-Şabbâḥ, who heard it from Ibn el-Kelbî, and also from 'Alî ibn el-Musawwar, who had it from el-Aşma'î, and also from el-Medâ'inî and other men whom he mentions, among whom are Abu-l-Yaqḏân, Ibn Da'b, Ibn Ja'diyeh, and el-Waqqâşî,—that Lebîd son of Rabî'ah came to the Prophet of God (may God bless him and grant him peace!) with a deputation from the Benû Kilâb after the death of his brother Arbed and 'Âmir ibn eṭ-Ṭufeyl: that he then professed el-Islâm, and, separating himself from his tribe, became a companion of the Prophet,<sup>3</sup> and was a sincere believer; that he afterwards settled in el-Kûfeh in the days of 'Omar ibn el-Khaṭṭâb (may God be satisfied of him!), and abode there until his death towards the end of the Khalîfeh-ship of Mo'âwiyeh. His life reached to a hundred and forty-five years, of which he lived ninety in the Ignorance and the rest under el-Islâm.

'Omar ibn Shebbeḥ says in his traditions, and I was also told by 'Abd-allâh ibn Moḥammed ibn Ḥakîm, that Lebîd said, when he reached the age of seventy and seven—

"My soul stood and plained to me with bitter weeping—

'I have borne thee now seven years over the three-score and ten'.

"I said—'and if thou wilt add but three thou wilt reach the goal of  
thy hope,

for in but three years more the fourscore will be filled.'"

And when he reached the age of ninety, he said—

"Now that I have overpassed my space by twenty\* years

I stand with shoulders bared to meet the stroke of Fate."

And when he lived to a hundred and ten, he said—

"Is there no life left for a man after that he has lived

a hundred years, and after that yet ten years more?"

And when he lived still longer, he said—

"Verily I am a-weary of life and its length

and of hearing men ask—'how goes Lebîd?"

Men are overborne, but he stands still unconquered,

by Time, the long, the everlasting dreary length!

I see the day come upon me and the night,

and each of them after its passing returns again :

Each day as it comes is like the day I met before—

it wanes not—I grow feeble—it but grows in strength."

Mohammed ibn el-Ḥasan ibn Dureyd informed me that he had been told by Abû Ḥâmid es-Sijistânî, who said that he had heard it from el-Aṣma'î, that 'Âmir ibn Mâlik Mulâ'ib-el-Asinnoh, whose by-name was Abu-l Bera', repaired with a company of the Benû Ja'far, among whom were Lebîd son of Rabi'ah, Mâlik son of Ja'far, and 'Âmir son of Mâlik Lebîd's uncle,\* to the Court of en-No'mân. And they found with the King er-Rabi' ibn Ziyâd of 'Abs, whose mother was Fâtîmeh daughter of el-Khurshub. Er-Rabi' was one of en-No'mân's boon companions, as was also a certain merchant of Syria whose name was Zarajûn\* son of Naufîl; the King had dealings with him in his trade, and, as he was a man of polished manners and abundance of jest and anecdote, delighted to make him merry. Accordingly, whenever en-No'mân desired to have a drinking party in private, he would send\* for the Syrian, and en-Niṭâsî, a physician who was in his service, and er-Rabi' son of Ziyâd, and they formed his company. And when the Ja'faris reached el-Ḥîreh, they came before en-No'mân to present their petitions; and as often as they went forth from his presence, er-Rabi' who remained alone with him used to abuse them to him and mention all their bad qualities: for the Benû Ja'far were enemies of the tribe of 'Abs.' And he did not cease backbiting them to en-No'mân until he made him ill-disposed towards them. And one day when the Ja'faris came before him, the King treated them with harshness, although he had formerly received them with honour and seated them near himself; and they left his presence in wrath. Now

Lebîd had been left behind to guard their goods and to take out their camels every morning to graze ; and he came to them one night when they were talking of what er-Rabî' had done, and asked them what was the matter ; but they refused to tell him. Then he said " By God ! I will not guard aught of your goods or take out a camel of yours to pasture, except ye tell me the whole matter." (And it must here be told that the mother of Lebîd was an orphan who had been brought up under the protection of er-Rabî'). They said " Thy mother's brother has slandered us to the King and turned away his face from us." Then said Lebîd—" Can ye arrange so that he and I shall be brought face to face ? I will withhold him from further mischief by a speech that shall bite and sting him : en-No'mân shall never have any regard for him again." " Hast thou anything to say to him ?" they asked. " Yes," said Lebîd. " Come, we will try thee," said they, " Satirize this herb." Now there was in front of them a plant with slender shoots and few leaves, growing close to the ground, of the kind called *et-teribeh*.<sup>9</sup> So Lebîd began<sup>10</sup> :—" This *teribeh*, which is neither fit for making a good fire, nor for nourishing a house, nor does it delight its neighbour—its sticks are mean, its leaves withered, its advantage little—the most evil of herbs for pasture, the poorest of them in leafage, the hardest of them to pull up—its country is far away, he that eats of it is a-hungered, he that lives thereon is a contented soul ! Set me face to face with the brother of 'Abs—I will drive him away from you in disgrace—I will leave him overwhelmed with confusion." They said " We will wait till the morning before giving thee our decision." And 'Âmir said to them—" Watch this boy of yours" (meaning Lebîd) : " if ye see him sleeping, he is not fit to undertake the contest with er-Rabî' : he speaks only what comes to his tongue ; but if ye find that he watches the whole night, then he is the man to do the deed." And they watched him, and found him mounted on one of the camel-saddles, with his teeth clenched on the pommel of it ; and so he remained till dawn. And they said " Thou art the man for the enterprise !" Then they took him and shaved his head, leaving only his top-knot," and clad him in a *hulleh*.<sup>11</sup> And he went forth with them, and they took him before en-No'mân. And they found him eating his morning meal in the company of er-Rabî' ibn Ziyâd : the two were eating together, and no third person was with them. And the palace and court were filled with deputations from different tribes. And when en-No'mân had done his meal, he gave permission to the Ja'faris to enter : and they went in ; and when their affair came on for hearing, they set forth the requests for which they had come. And er-Rabî' interrupted their speech. Then Lebîd said—

" Shall my head be driven hither and thither every day ?

Many the battle that is better than quietness !

We are the children of the Mother of the Four,

Our swords are keen, our platters ever full :

We are the best of 'Āmir son of Ṣa'sa'ah—  
 Cleavers of skulls in the midst of the battle-din:  
 We give to eat to all men from our brimming bowls  
 — Stay ! God keep thee from cursing ! eat not with him !

\* \* \* \* \*

En-No'mân withdrew his hand from the food that was before him, and said, "By God ! boy—thou hast disgusted me with my meat : I never felt for it the loathing that I feel to-day !" Then er-Rabi' started forward, and said, "He lies, by God ! the son of an unchaste woman ! verily I did with his mother thus and thus !" And Lebîd said to him—"Such an one as thou did as thou sayest with a nurseling of his house, his own near kins-woman ! Nay, my mother was of those women who do not the things thou sayest." And en-No'mân satisfied the requests of the Ja'faris at once and dismissed them. And er-Rabi' son of Ziyâd immediately went to his house. And en-No'mân sent to him double of what it was his custom to give him, and bade him depart to his people. And er-Rabi' wrote\* to him saying—"I know that what Lebîd said has made a deep impression on thy heart ; and I will not cease entreating thee until thou send one to strip me and proclaim to those about thee that I am not as he said." But the king replied to him—"Nay, thou canst do nothing now to shield thyself from what was said of Lebîd, nor canst thou recall again that with which men's tongues are busy. Go and join thyself to thy people." And er-Rabi' departed to his people, and sent from among them the following verses to en-No'mân—

"If I have driven away my camels, verily I have a spacious place of plenty  
 —there is no place of plenty like it in breadth and length :

A place where, if all Lakhm were to come down thereon,  
 they would not match with their wealth one feather of Semwîl.

The she-camels with their young ones graze on the juicy herbage there,  
 though it be not like your pastures of salt and honey.

Stay thou in thy land alone, and recline now that I am gone  
 now with en-Niṭâsî and now with Naufil's son."<sup>14</sup>

And en-No'mân answered him in these words—

"Hasten with thy camel-saddle whithersoever thou wilt, so that it be away  
 from me,

but lengthen not speech upon me, and leave thy vain discourse.

I have been told a thing that I shall never forget,  
 while Egypt lies by the side of Syria and the Nile.

And what boots thy defence of thee against it, now that it has been borne  
 abroad

by the swift riding-camels through the rugged plains of Semwîl ?  
 The thing has been said, be it true or be it a lie,  
 and what shall excuse thee from a thing that has once been said ?  
 Betake thyself where thou findest the land so broad and wide,  
 and feast thine eyes thereon in all its breadth and length !”<sup>10</sup>  
 And it is said that Lebîd also satirized er-Rabî‘ in the following verses,  
 which some however allege to be spurious—<sup>11</sup>

“ O Rabî‘—let not any one bring thee before me  
 And ask me of thy faults and thy true nature  
 Or enquire what man thou art and what thou wast !  
 For thou, when the battle-press girds thee round, art like  
 Naught but a thing which hindrances constrain ;  
 Verily thou sippest naught but a sip and tastest it ;  
 If he that withstands thy flight but feel thee, surely  
 He will find thee even lighter than himself ;  
 Verily thou art an old traitor, a hypocrite,  
 A manifest villain that returns to his villainy again and again.”

Lebîd used to compose poems, but forbade them to be published until he composed his *Mo'allagah* ; and what had been done by er-Rabî‘ son of Ziyâd and Hamzeh son of Damarah and the other chiefs who formed their company having been mentioned, Lebîd said to his people “ Publish now my poems.”

I quote from the book handed down by Abu-l-Ḥakem : he says—“ I was told by el-‘Alâ son of ‘Abdallâh el-Muwaqqâ‘ that Lebîd was once present among a company of persons who were telling tales by night in the house of el-Welîd son of ‘Oqlbeh,<sup>12</sup> who was governor of el-Kûfeh. And el-Welîd asked Lebîd of what passed between him and er-Rabî‘ son of Ziyâd before en-No‘mân. Lebîd replied, ‘That befell in the days of the Ignorance : but now God has brought to us el-Islâm.’ And el-Welîd said, ‘I adjure thee that thou tell me.’ And when an Amîr used this form of asking, it was considered necessary to obey him ; so Lebîd began to tell the tale. And a certain man of Ghani<sup>13</sup> who bore a grudge against him said—‘We were not informed of this.’ ‘Doubtless, son of my brother,’ said Lebîd, ‘thy father could not come by the knowledge of things like this : he was not of those who were admitted to witness them, that he should tell thee of them.’ ”

My uncle told me that he had been informed by el-Kirânî, who heard it from el-‘Omârî, who was told by el-Heythem, who learned it from el-‘Ayyâsh, who was told by Mohammed ibn el-Munteshar, that Lebîd was never heard to boast of his former state after he became a Muslim except one day, when he happened to be in a courtyard belonging to Ghani. He was lying on his back, having wrapped himself in his mantle, when there

approached him a young man of Ghanî who said—"May God bring evil upon Tufeyl for that he said<sup>20</sup>—

'May God requite Ja'far for what they did to us when our sandals

made us of those who tread the earth and slipped so that we fell!

They refused to be weary of us : and verily if our mother

had met from us that which they met, she would have been a-weary!

The lord of abundant wealth and every afflicted one—

in the chambers of their house they were warmed and sheltered :

They said "Hasten in hither, until ye can see your ways

when the darkness is folded away by the dawning of the day."'

Would that I knew what good he met at the hands of the Benû Ja'far, that he should say this of them"! And Lebîd drew aside the mantle from his face and said—"Son of my brother! the men that thou knowest belong to a time when a Police has been established, when men call on one another for help and receive it: when a House of public provision has been set up whence the servant goes forth with a wallet to feed the hungry, and a Public Treasury from which every Muslim receives his stipend; but if thou hadst known Tufeyl on the day when he said this, thou wouldst not have reviled him." Then he lay down again on his back, saying, "I ask pardon from God!" and he continued to repeat these words until he arose from rest.

Ismâ'il ibn Yûnus informed me that he had been told by 'Omar ibn Shebbeh, who heard it from Moḥammed ibn Ḥakîm, who had it from Khâlid ibn Sa'îd, that Lebîd one day in el-Kûfch passed by a place where a company of the Benû Nahl were sitting: and he was supporting himself by a hooked staff. And they sent a messenger to ask him who was the best poet of the Arabs. He replied—"The Wandering King, the Man of the Ulcers." And the messenger returned and told them, and said "This is Imra' el-Qeys." Then he returned again and asked him "Who next?" He answered "The Boy of the Benû Bekr that was skinned." And he came back and told them, and said "This is Tarafch." Then he returned a second time and asked "Who next?" Lebîd answered—"Next after these is 'the Man of the Hooked Staff,' meaning himself. This story is differently told by Aḥmed ibn 'Abdallâh ibn 'Anmâr, who says that it was related to him by Ya'qûb eth-Thaqafî, Ibn 'Ayyâsh, and Mi'sar ibn Kidâm, all of whom heard it from Abû-el-Melik ibn 'Omar, who affirmed that he had been told it by the very person who was sent to Lebîd by the men who were called "The noble reciters of the Qur'ân—*el-qurrâ' el-ashraf*." (El-Heythem says that he asked Ibn 'Ayyâsh who were "the noble reciters of the Qur'ân," and that he replied that they were Süleymân son of Şarad el-Khuzâ'i, el-Musayyab son of Nejbeh el-Fozâri, Khâlid son of 'Orfuṭah ez-Zuhri, Mesrûq son of el-Ajda' el-Hamdânî, and Hânî son of 'Orweh el-Murâdî.)

Lebîd was then in the mosque, having in his hand a hooked stick; "and I said to him" (says the messenger) "'O Abû 'Aqîl! thy brothers send thee greeting and ask thee to tell them who is the best poet of the Arabs.' He answered—'The Wandering King, the Man of the Ulcers.' And they sent me back to him to ask who was the Man of the Ulcers: he replied 'Imra' el-Qeys.' Then they sent me again to him to ask 'Who next?' He answered 'The Boy of Eighteen<sup>21</sup> Years.' They bade me ask him whom he meant: he replied 'Tarafch.' Then they sent me a third time to ask—'And who then?' he said—'The Man of the Hooked Staff, where he says—

"Verily fear of our Lord is the best of spoils:

—it is by God's leave that I go late or soon;

I give praise to God—He has no like:

in His hand is all good: what He wills He does.

Whom He leads in the paths of good is guided aright

with a quiet heart: whom He wills He leads astray."

meaning himself: then he said 'I ask pardon of God!'

Ahmed ibn 'Abd-el-'Azîz [el-Jauhârî] informed me that 'Omar ibn Shebbch had told him that he had heard from Abû 'Obeydeh that Lebîd composed only one verse after he became a Muslim, namely:—

"Praise be to God that my end came not to me

until I clad myself in the robe of el-Islâm."

The same Ahmed states that he was told by his uncle, who heard it from Moḥammed ibn 'Abbâd ibn Ḥabîb el-Muhellebî, who was told by Naṣr ibn Da'b, who had it from Dâûd son of Abû Hind, who learned it from esh-Sha'bî, that 'Omar ibn el-Khaṭṭâb wrote to el-Mughîreh son of Sho'beh,<sup>22</sup> who was governor of el-Kûfeh, bidding him cause the poets of his government to recite before him the poems they had composed under el-Islâm. And he sent for el-Aghleb the *Râjîz*, el-'Ijlî, and said to him "Recite to me thy verses." And he answered—

"Dost thou wish for an epigram or an ode?

Verily thy request is easy to satisfy at once!"

Then he sent for Lebîd and bade him recite. And Lebîd said—"Dost thou desire aught of what has been wrapped in forgetfulness?"—meaning his verses of the days of the Ignorance. "No," said el-Mughîreh, "recite to me that which thou hast composed under el-Islâm." And Lebîd left him, and went and wrote out on a sheet of paper the Chapter of the Cow,<sup>23</sup> and returning with it said—"God has given me this in exchange for poesy since I became a Muslim." And el-Mughîreh wrote all this to 'Omar; and the Khalifeh diminished the stipend of el-Aghleb by five hundred pieces of silver, and added them to that of Lebîd, which thus amounted to two thousand five hundred dirhems. And el-Aghleb wrote to the Prince of the Believers, saying—"Dost thou diminish my allowance because I obeyed

thee?" And 'Omar returned to him the five hundred dirhems, but left the stipend of Lebíd at two thousand five hundred. Abû Zeyd relates that Mo'âwiyeh when he became Khalifeh desired to retrench the odd five hundred from the allowance: for he said—"The two posts" (meaning the two thousands) "are well enough: but what need is there for the cross-piece?" (meaning the five hundred). And Lebíd replied to him—"I am but an owl" of to-day or to-morrow: return to me the name of it: for perchance I shall never touch the thing itself, and thou wilt save both the cross-piece and the two posts." And Mo'âwiyeh's heart was touched, and he left him his stipend undiminished; but Lebíd died before he could receive it.

'Omar ibn Shebbeh relates in the traditions which he gathered from 'Abdallâh ibn Moḥammed ibn Ḥakīm, and I have been told by Ibrâhīm ibn Ayyûl, who had it from 'Abdallâh ibn Muslim, that Lebíd was one of the most generous of the Arabs; he had sworn in the days of the Ignorance that the East wind should never blow without his giving a feast to the poor. And he had two great bowls which he used to fill with meat morning and evening at the place of prayer of his people, and feed men out of them. And one day the East wind blew when el-Welid son of 'Oqbeh<sup>25</sup> was governor of el-Kûfeh. And el-Welid mounted the pulpit and pronounced the *Khutbah* before the people; then he said—"Your brother Lebíd son of Rabī'ah made a vow in the days of the Ignorance that whenever the East wind blew he would feed those in need. Now this is one of the days of its blowing: help him therefore. As for me, I will set you the example." Then he came down from the pulpit, and sent to Lebíd a hundred young she-camels, and wrote to him these verses—<sup>26</sup>

"I see the butcher sharpening his two knives  
when the breezes of Abû 'Aqīl are blowing:  
High-nosed is he, high-headed, a man of 'Âmir—  
long are his arms even as a polished blade.

The son of the Ja'farī fulfilled his oaths,  
in spite of infirmities and slender store,

By slaughtering large-humped camels when there swept by  
the skirts of the East wind blowing at eventide."

When Lebíd received these verses, he said to his daughter—"Answer him: for by my life! I have lived a long time, and am too weary to reply to a poet." So his daughter composed these lines—<sup>27</sup>

"When there blow the breezes of Abû 'Aqīl  
at their blowing we call for help to el-Welid;  
High-nosed is he, keen-hearted, of 'Abd-Shems's line:  
he has holpen in his generosity Lebíd

By the gift of camels like hills, as though a company  
of the sons of Ham were riding on their backs.

O Abû Wahb, may God requite thee with good !

we have slaughtered them : now give us to eat the *therîd* !

Renew thy gifts ! verily the generous man gives again and again,  
and my assurance is that thou wilt certainly give again."

And Lebîd said to her—"Thou wouldst have done very well indeed if thou hadst only not asked him to give thee more to eat." She said—"Nay, but kings never count it a shame that men should ask of them." He answered—"Verily, O my little daughter, in this thou art most of all a poet !"

Alîmed ibn 'Abd-el-'Aziz informed me that he had been told by 'Omar ibn Shebbeh, who heard it from Mo'hammed ibn 'Imrân ed-Dabbî, who was told by el-Qâsim ibn Ya'la, who had it from el-Mufa'ddal ed-Dabbî, that el-Farezdaq<sup>29</sup> one day chanced to pass by the mosque of the Benû Uqeysir, where there was a man who was reciting some verses of Lebîd's among which was the following—

"The torrents have scored afresh the traces of the tents, as though  
they were lines of writing in a book which the pens make new  
again."

And el-Farezdaq prostrated himself. And they asked him—"What is this, O Abû Firâs?" he answered, "Ye know the prostration which is the due of the Qur'ân, and I know the prostration which is the due of song."

Isnâ'il ibn Yûnus the Shî'i states that he heard from 'Omar ibn Shebbeh, who had it from Ibn-el-Bawwâb, that the Khalifeh el-Mo'taşim<sup>30</sup> one day was sitting at a wine-party, when one of the singers sang—

"The sons of el-'Abbâs know not how to say *no* :

*Yes* rises lightly to their tongues ;

Their mildness adds lustre to their noble strain—

thus is mildness the ornament of generosity."

El-Mo'taşim said—"I do not know these verses—whose are they?" They said "Lebîd's." "Why," said the Khalifeh, "what had Lebîd to do with the sons of el-'Abbâs?" The singer replied—"What Lebîd said was—

'The sons of er-Rayyân know not how to say *no*.'

It is I that put el-'Abbâs in place of er-Rayyân." And el-Mo'taşim praised and rewarded him. Then the Khalifeh, who had a great admiration for the poems of Lebîd, said—"Who among you can recite his poem beginning—

'We wither away : but they wane not, the stars that rise on high'?"

And one of those that sat with him said "I." He said "Recite it to me." And he began—<sup>30</sup>

"We wither away : but they wane not, the stars that rise on high,  
and the hills endure, and the mighty towers, though we be gone.  
I dwelt under the shade of a house that all men sought,  
and there has left me in Arbed a neighbour that helped me well."

And el-Mo'taşim burst into a flood of tears, and invoked God's mercy upon el-Māmûn—"For such a brother," said he, "was he to me." Then he went on, reciting the rest of the poem himself—

"Nay, wail not, if the Days have sundered him from me—

One day the stroke of Time shall fall upon all of us !

The race of men is nought else than a tent-place and its folk—

the day that they leave it void, it returns to its loneliness.

They pass forth from it in bands, and it remains after them

even as an empty palm with the fingers folded thereon.

And what is man but a kindled brand whereof the glow

sinks into ashes when once its blaze has spent itself ?

And what is man but hidden thoughts of good intent ?

And what is wealth but a loan, a trust to be given back ?

Lies there not before me, even though death should be slow to come,

the comradeship of the staff over which my fingers close ?

I tell tales of the ages that have long passed away ;

I totter along—when I rise, my body is bent in twain ;

I am become like a sword that has worn out its sheath—

far away are the days of its forger, but still its point is keen.

'O go not away from us !' Nay—but death is our trysting-place

—ready is it to come—nay, it is even here !

O thou that chidest, what assures thee but thine own dream

—when men have gone their way, who is he that will bring them  
back ?

Dost thou tremble before what Time has brought on the brave ?

Where is the generous man on whom Fate's stroke falls not ?

By thy life ! there knows not any waiter on the pebble's cast,

nor any watcher of the flight of birds, what God is doing !"

He that tells the tale says "We marvelled, by God ! at the beauty of the words, the correctness of his recitation, and the excellence of his choice of a piece to recite."

El-Hoseyn ibn 'Alî informed me that he had been told by Moḥammed ibn el-Qâsim ibn Mahraweyh and Moḥammed ibn Jerîr eṭ-Tabarî, who said that he had learned it from Moḥammed ibn Ḥamid er-Râzî, who was told by Selameh ibn el-Faḍl, who heard it from Ibn Ishâq, that 'Othmân ibn Maḏ'ûn<sup>a</sup> was dwelling under a covenant of protection with el-Walîd ibn el-Mughîreh ; and one day, reflecting with himself, he said "By God ! it is not becoming that a Muslim should dwell safely under the protection of a *Kâfir*, when the Prophet of God (may God bless him and grant him peace !) is in fear of them." And he came to el-Walîd and said to him—"I desire that thou be free from thy covenant of protection with me." El-Walîd said "Perhaps thou hast conceived some doubt of me." "No," said 'Oth-

mân, "but I wish thee to do as I ask." And el-Welid said—"Come with me, that I may be quit of thee in the place where I took thee upon myself." And he went with him to the Holy Temple<sup>22</sup>; and when he found himself there face to face with a company of the Qureysh, he said to them—"This is Ibn Mað'ûn—I took him under my protection, and now he asks me to withdraw my shelter from him: is it as I say, O 'Othmân?" "Yes," said he. Then said el-Welid, "I call you to witness that I am quit of him." The teller of the tale goes on to say that there were sitting there a company of the Qureysh to whom Lebîd son of Rabi'ah was reciting his verses; and 'Othnân went and sat down with the people. And Lebîd said—

"Yea, everything is vain except only God alone!"

And 'Othmân said to him—"Thou speakest truth." And Lebîd continued—

"And every pleasant thing must one day vanish away."<sup>23</sup>

And 'Othmân said—"Thou liest!" And the people knew not what he meant; and one of them signed to Lebîd to repeat the verse again, and he did so; and 'Othmân again said that he spoke truth in the first half-verse, and lied in the second: for the delights of Paradise shall never vanish away. And Lebîd cried—"O ye people of the Qureysh! there used to be no such man as this in your assemblies!" And Ubayy son of Khalaf (others say, his son) rose and smote 'Othmân on the face; and some one said to 'Othmân—"But yesternight thou wast safe from treatment like this." He replied—"How needful is it for this sound eye of mine that there should befall it what befall the other for the sake of God!"

Mohammed ibn Khalaf ibn el-Marzubân told me that he had heard from Ahmed ibn el-Heythem, who was told by el-'Omari, who learned it from el-Heythem ibn 'Adi, who had it from 'Abdallâh ibn 'Ayyâsh, that [the Khalifeh] 'Abd-el-Melik wrote to el-Hajjâj bidding him send to him esh-Sha'bi;<sup>24</sup> and he sent him. And the Khalifeh attached him to his sons, and bade him educate and instruct them. Ibn 'Ayyâsh continues—"He invited me one day to visit him during the illness of which he died: and he choked with a morsel of food while I was with him. And he rested himself for a long time: then he said—"I have become as the poet says—

"I am as though, now that I have over-passed seventy years,<sup>25</sup>

I had stripped my shoulders bare to meet the stroke of Fate."

But he lived till he reached a hundred and ten, when he said—

"Is there no life left for a man after that he has lived  
a hundred years, and after that yet ten years more?"

Still he lived on till he reached a hundred and twenty, when he said—

"Verily I am awearied of life and its length  
and of hearing men ask 'How goes Lebîd?'

Men are overborne, but he stands still unconquered

by Time, the new, the everlasting dreary length;

I see the day come upon me and the night,

and each of them after its passing returns again.” •

And he was glad and congratulated himself, and said ‘I do not think there is any fear for me : already I feel much relieved.’ And he bade them give me four thousand dirhems ; and I received them and was going out, but had not reached the door when I heard the cry of the wailing woman who proclaimed that he was dead.” •

El-Ḥasan ibn ‘Alī informed me that he had been told by Moḥammed ibn el-Qâsim ibn Mahraweyh, who heard it from Hârûn ibn Muslim, who was told by el-‘Omari, who learned it from el-Heythem ibn ‘Adī, who had it from Ḥammâd er-Râwiyeh, that en-Nâbighah eḥ-Ḍubyânî<sup>20</sup> looked upon Lebid son of Rabi’ah when he was a boy with his uncles at the gate of the palace of en-No’mân son of el-Munḍir, and asked who he was ; and his gencalogy was repeated to him. Then en-Nâbighah said to him—“ Boy, thine eyes are assuredly the eyes of a poet ! Dost thou ever compose verses ? ” “ Yes, O my uncle,” answered Lebid. “ Recite then to me something of thy composition,” said en-Nâbighah. And he recited to him his poem beginning—

“ Abode she not in Spring in this desolate camping-ground ? ”

And en-Nâbighah said—“ Boy, thou art the best poet of the Benû ‘Âmir ! More, O my son ! ” Then Lebid recited—

“ There are traces of Khauleh in er-Râsis, but of long ago.”

And en-Nâbighah smote his sides with his hands and cried—“ Go ! thou art the best poet of all Qeys ! ” (others say he said “ of all Hawâzin ”). This story was however told me differently by my uncle, who heard it from el-‘Omari, who had it from Laqîṭ, who heard it from his father and from Ḥammâd er-Râwiyeh, who learned it from ‘Abdallâh ibn Qatâdeh el-Moḥâribî, who said that he was himself standing with en-Nâbighah at the gate of en-No’mân son of el-Munḍir. “ En-Nâbighah said to me ” (says ‘Abdallâh) “ ‘ Hast thou seen Lebid son of Rabi’ah among those here present ? ’ ‘ Yes,’ said I. ‘ Who is the best poet of them ? ’ said he. ‘ The young men whom thou hast seen do thus and thus,’ said I, describing him. Then he said—‘ Sit by me until he comes forth to us ’ ; so we sat down, and when Lebid came out to us, en-Nâbighah called to him—‘ Come hither, son of my brother ! ’ and he came up : and en-Nâbighah bade him recite some of his verses, and he recited—

‘ Hast thou not drawn nigh to the desolate camping-ground  
of Selmâ in el-Meḍâ’ib and el-Qafâl ? ’

And en-Nâbighah said to him—‘ Thou art the best poet of the Benû ‘Âmir ! More ! ’ and he went on—

‘ There are traces of Khauleh in er-Resis, but of long ago,  
—in Ma’âqil, and el-An’amân, and Shûm.’

And en-Nâbighah cried—'Thou art the best poet of Hawâzin! More still!' and he continued—

'Effaced are her resting places, where she stayed but a while and  
where she dwelt long,

in Mina: desolate are her camps in Ghaul and er-Rijâm.'

And en-Nâbighah said—'Go thy ways! thou art the best poet of the Arabs!'

Alhmed ibn 'Abd-el-'Azîz told me that he had heard from 'Omar ibn Shebbeh, who was told by 'Abdallah ibn Moḥammed ibn Iḥākīm, who learned it from Khâlid ibn Sa'îd, that Lebîd, when his end was approaching, said to his brother's son (for he had himself no male issue)—"O my son! verily thy father is not dead, he has but passed away. When thy father is taken, place his body with its face to the *Qibleh*, and wrap it in its raiment; and raise no loud wailing over it; but see these two bowls of mine wherefrom I used to feed the poor: fill them with meat and carry them to the mōsque; and when the *imâm* has pronounced the *selâm*,<sup>38</sup> bring them forward for men to eat therefrom; and when they have eaten, say to them—'Come ye to the funeral of your brother.' " Then he recited his verses—

"When thou buriest thy father, lay  
over him wooden planks and clay—  
Broad flags of stone, hard, firm-set,  
that shall stop the chinks of the branches<sup>39</sup> strewn  
Above him, and keep his cheeks unstained  
by the dust of earth—But they will not keep them!"

Khâlid ibn Sa'îd says that these verses are taken from a long ode; and Yûnus has mentioned that Ibn Sureyj set to music certain verses of the same poem: but he does not state more particularly the air to which they were set. The following are the verses he gives:<sup>40</sup>—

"O my little son, hast thou seen my uncles,  
the sons of the 'Mother of the Sons'?  
And my father round whom the wretched ones  
flocked in the bitter winter days:  
And Abû Shureyk and the alightings  
in the place of straitness where we met them?  
Never have I seen or heard of  
the like of them in all the world!  
And I have out-lasted them all, and yearn  
clinging to the fellowship I had with them.  
Leave me and what my right hand owns,  
if therewith I have done aught to strengthen men,  
And do with what is thine as it comes into  
thy mind, giving help asked or unasked."

Khâlid adds that he said to his two daughters when death was upon him—

“They wish, my two girls, that their father should live for ever :

—Am I aught else than a son of Rabî'ah or Muḍar ?

And if it should hap one day that your father come to die,

rend not your cheeks, ye twain, shear not your hair for me !

But say—<sup>2</sup> He was a man who never wronged an ally,

who never betrayed a friend, or did aught of treachery’

Until the year is done : then the name of peace be on you !

for he who weeps for a year has discharged what is due from

him.”

And after his death his daughters used to array themselves and go every day to the meeting-place of the Benû Ja'far ibn Kilâb, and mourn there for their father ; but they did not weep or wail, even as he had bidden them. And they continued thus for a year, and then went their ways.

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In vol. XV of the Aghânî (pp. 137 sqq.) the story of the death of Lebîd's uterine brother Arbed (son of Qeys, son of Jez', son of Khâlid, son of Ja'far, son of Kilâb), who was slain by a lightning-stroke, is told at great length. Two different versions of the tale are given, according to the first of which (extracted from the history of Moḥammed ibn Jerir eṭ-Ṭabarî, and resting on the authority of 'Amr ibn Qatâdeh) the circumstances were the following. A deputation of the Benû 'Âmir ibn Şa'sa'ah, headed by 'Âmir ibn eṭ-Tufeyl, Arbed ibn Qeys, and Ḥayyân ibn Sulma, waited upon the Prophet. 'Âmir had arranged with Arbed that he should occupy the attention of Moḥammed by conversation, while Arbed slew him when he was off his guard. This project failed, Arbed excusing himself for not attacking the Prophet by saying that 'Âmir stood between him and Moḥammed, and he could not smite the latter without striking the former. On their return 'Âmir fell sick of a carbuncle on his neck, and died in the tent of a woman of the Benû Salûl. Arbed when he reached his home was asked what had befallen between him and Moḥammed : he replied “He invited us to worship a thing which I should like to see before me now : I would shoot it with this arrow and slay it.” And a day or two after this speech he went out with a camel which he intended to sell, and was killed together with his camel by a lightning-stroke.

The other version is extracted from the book of Yahya ibn Ḥâzim, and rests on the authority of Ibn Da'b. According to it, Lebîd's uncle 'Âmir ibn Mâlik Abû Be'ra', being sick of an internal tumour, sent Lebîd with a present of camels to Moḥammed, begging him to pray for his recovery. The Prophet said—“If I accepted anything from a polytheist, I would accept the present of Abû Be'ra'” ; then he spat upon a lump of clay and gave it to Lebîd, bidding him dissolve it in water and give it to 'Âmir to

drink, when he would be healed of his disease. Lebîd on this occasion stayed some time with Mohammed and heard the Qur'ân, and while there copied out on a sheet of paper these words—"er-Raḥmânus 'allama-l-Qur'ân" ["God the Merciful has taught men the Qur'ân"] and carried them home with him. 'Âmir recovered as the Prophet had said; but Arbed, whom Lebîd met on the way home and told of Mohammed's noble bearing and holiness, and to whom he read the words he had written, impiously replied—"Would that I might meet er-Raḥmân in this waste—my blood be upon me if I smote him not with my sword!" And shortly afterwards, going out in the night to search for his camels, he was struck dead by lightning in the place where he had spoken these words. Of these two stories the first is to be preferred, as most in accordance with the other known facts of Lebîd's life, and with the tenor of the *marthiyehs* or dirges which he uttered over Arbed. Several of these have been preserved; one has already been given: the following few lines are to be found in the *Ḥamāseh*, and the *Aghânî* tells us (p. 140) that they were quoted by the first Khalîfah Abû Bekr and applied by him to the Prophet—

"By my life! verily if the messenger spoke true,  
a grievous stroke has fallen on Ja'far from the hand of Fate!  
A brother was he that gave me aught that I asked of him  
freely, and pardoned all the wrong that I did to him!"

#### NOTES TO THE NOTICE OF LEBID.

- <sup>1</sup> The second hemistich of this couplet offers some difficulty. De Sacy reads

فراخ لها خط الكتيبة اجمع

and renders "tandis que la ligne entière de l'escadron avoit été enfoncée et avoit cédé à leur violence." But the reading of the Bûlâq edition of the *Aghânî* is distinctly

فراخ لها حظ الكتيبة اجمع

and the use of **حظ** in the sense of **صَف** is of doubtful authority; while the rendering given above would require the line to begin with **وقد**. The translation adopted follows the explanation of the phrase **راح للشيء** given by Lane, and understands the hemistich as meaning that the whole fortune of the war hung on the spear-points which 'Âmir took to himself: he was the *fâris-el-jeysh*—"the knight of the host," a warrior such as 'Antarah draws for us in vv. 64 to 71 of his *Mo'allaqah*.

<sup>2</sup> Lebîd was thus nearly connected with the king of Hawâzin, Zuheyr son of Jeðimeh, who was slain by Khâlid son of Ja'far of 'Âmir, Lebîd's great uncle on the father's side; he was (through his mother) first cousin once removed of Qeys son of Zuheyr, the leader of 'Abs in the war of Dâḥis. It should be added that the text of the *Aghânî* appears to make Zinbâ a woman, whereas the name is that of a man; we may perhaps understand "one of the daughters of Jeðimeh" as applying to Tâmileh, and "daughters" as meaning female descendants generally.

<sup>3</sup> *Hâjara*. De Sacy renders "qu'il accompagna ensuite le Prophète dans sa fuite à Médine." This, however, is impossible, for the death of 'Âmir ibn et-Ṭufeyl occurred in A. H. 10.

\* *Twenty.* De Sacy line reads *tis'in* (ninety) for *'ashrin* (twenty), which latter reading existed in his MS. as well as in the Bûlâq edition: it does not seem necessary to do violence to the text.

\* It will not escape notice that this passage does not agree with the genealogy given at the head of the article, inasmuch as it distinguishes between Lebîd's uncle, 'Âmir son of Mâlik, and, 'Âmir Abu-l-Bera' or Abû Nizâr, Mulâ'ib-el-Asinnch. This story is told over again (with a different *isnâd* but in almost the same language) at p. 22 of Vol. XVI of the Aghânî; this does not appear to have been observed by De Sacy. The obscure passages in the text before us have in some cases light thrown upon them by variants in the second version.

\* Zarujûn: the second version gives the name as Sarahûn.

\* This enmity was doubtless due to the slaying of Zuheyr son of Jâ'îmch by Khâlid son of Jâ'far.

\* In our text the words are بقول محيص مؤلم. In the second version they are بقول مضى. I have translated as if مضى stood in place of محيص.

\* In our text the words are تدعى الثرية. In the other text they are الثرية; the latter is the more usual spelling of the name: *vide* Lane s. v. ثرية. The plant is variously described, and according to Lane the name is now applied to what is called in Persian خنقی, *i. e.*, *thlaspi*. *Thlaspi*, an insignificant weed of the natural order *Cruciferae*, the well-known "shepherd's purse," suits the passage well. (De Sacy's MS. appears to have read الثرية, which he renders "de l'espèce qu'on nomme *thériyya*, c'est à dire, humide"; the word meaning *moist* is, however, ثمر, fem. ثرية without *tashdid*.)

\* This speech of Lebîd's, which naturally loses its chief flavour in a translation, is in rhyming prose, each rhyme being three times repeated. The speech is given with slight variations, but substantially the same in sense, in the notice of er-Rabî' in Vol. XVI.

\* "Top-knot", *ḥu'âbetahu*: here it is in the singular, and therefore means either the top-knot or forelock: in the other version the word is in the dual, and means the two curls, one on each side of the head, commonly worn by boys.

\* *Hulleh* is the name of a dress consisting of three garments, a shirt, an *izâr* or waist wrapper, and a *ridâ* or wrapper for the whole body.

\* This address is in the *Rejex* metre: each line rhymes with all the rest. In line 3 "Thâ Mother of the Four sons" is the wife of Mâlik ibn Jâ'far: she had really five sons, *viz.*, 'Âmir, Ṭufeyl, Rabî'ah, 'Abîdch and Mo'âwiyeh. Ibn Qutaybeh thinks (Ma'ârif, ed. Wüstenfeld, p. 43) that the poet has put four instead of five merely for the sake of the rhyme: it may be, however, because four only were famous among the five. *Umm-el-benîn* "Mother of the Sons" was an honoured title which was borne by many Arab mothers; er-Rabî's own mother Fâtîmeh was known by it: her sons were called *el-kemeleh*, "the perfect." The last four lines of the piece cannot be decently rendered into English, but they will be found in De Sacy's French. Lebîd charges er-Rabî' with being afflicted by the white leprosy called *baras*, and puts the charge in a manner calculated to cause extreme disgust in the King. In the notice of er-Rabî' in Vol. XVI, the piece has two more lines, making fourteen in all, beside other minor variations.

\* "Wrote." That er-Rabî' knew how to write is proved by the fact that he, with all the other sons of Fâtîmeh daughter of el-Khurshub, was called *Kâmil*, "perfect," which in the days of the Ignorance meant "a man who was a poet, valiant,

able to write, a skilful swimmer and a good shot with the bow." (Quoted from the Kitâb e-Aghânî by Causse, de Perceval, Journal Asiat. Dec. 1836, p. 533.)

<sup>15</sup> These verses present many points of difficulty : they occur again in Vol. XVI, pp. 23, 24, and the readings there given differ in some particulars from those given here. In line 1, De Sacy reads, for the roading of his MS. and the Bûlâq edn., لَأَلِي سَعَةً, but this will not scan, while the reading of the text seems to be nonsensical. I have preferred the reading of Vol. XVI, p. 23, viz., إِنَّ لِي سَعَةً. In line 3

Lakhm is the family name of the kings of el-Hîrah. "Come down" i. e. to water—*waradet* : Vol. XVI, p. 24 reads *wuzinet* "were weighed." In line 4 there seems to be a play on the word *riah*, which means both wealth and feathers. *Semwil* is here given with *sin* : in Vol. XVI, it appears as *Shemwil* with *shin*. In both places the Bûlâq ed. reads *rishi* Semwilâ ; but De Sacy gives *ibni* Shemwilâ, and translates "fils de Samuel," i. e. the famous es-Semau'al of el-Ablaq in Teymâ. It is true that in the reply of en-No'mân, as given in Vol. XIV, line 6 speaks of *ibni Semwilâ* : but in Vol. XVI, the reading is *abrâq Shemlîlâ*. I find in the *Marâsid* a place *Semcil*, of which all that is said is that it is "a place abounding in birds." This seems to suit the passage best ; at any rate the change of السَّمَوِلُ es-Semau'al to Shemwil شَمَوِيل requires strong support before it can be accepted.

In line 7, De Sacy's الرِّزَائِم should be changed to الرِّوَائِم ; his conjectured reading اِحْرَارِ البَقُول for the meaningless حَرَارِ البَقُول is supported by the version of Vol. XVI, and has been adopted. In v. 8 a word occurs which is found in no dictionary, viz., عَسَوِيلَا (Agh. Vol. XIV,) or غَسَوِيلَا (id. Vol. XVI,) or غَشَوِيلَا (De Sacy). De Sacy renders لا مَثَل رَعِيكُم مَلَحًا وَغَشَوِيلَا "elles ne sont pas, comme chez vous, réduites à manger des herbes saumâtres ou nitreuses." But salt pastures are just those which camels like : and it seems possible that عَسَوِيل may be connected with عَسَل honey.

<sup>16</sup> These verses, like those of er-Rabî' just quoted, show variations in the different versions. The second couplet as I have rendered it runs

فَقَدْ ذَكَرْتُ بِشِي لَسْتُ نَاسَهُ مَا جَاوَرْتُ مَصْرَ اِهْلِ الشَّامِ وَ النِّيلَا

(The Bûlâq ed. reads جَاوَرْتُ apparently only by a misprint. De Sacy prefers to make اِهْلِ الشَّام the nom. to جَاوَرْتُ, and مَصْرَ and النِّيلَا the accusative after it, and this rendering has much to recommend it). But in Vol. XVI the verse appears thus

فَقَدْ ذَكَرْتُ بِهِ وَالرَّكْبَ حَامِلَهُ وَرَدَا يَعْلِلُ اِهْلَ الشَّامِ وَ النِّيلَا

to the second hemistich of which it is difficult to assign a meaning.

The third couplet runs in our text thus—

فَمَا اِتَّفَاوْكَ مِنْهُ بَعْدَ مَا جَزَعْتُ هَوَجَ الْمُطَيِّ بِهْ نَحْوِ ابْنِ سَمُوِيلَا

In Vol. XVI, it runs

فَمَا اِتَّفَاوْكَ مِنْهُ بَعْدَ مَا جَزَعْتُ هَوَجَ الْمُطَيِّ بِهْ اِبْرَاقَ شَمِيلَا

Now if we take *Semwil* as the name of a place, ابْنِ سَمُوِيلَا is obviously inappropriate. I have therefore adopted, in lieu of نَحْوِ ابْنِ اِبْرَاق from the other version. *Abrâq* is not given in Lano : but it seems a permissible plural from بَرَق plural of بَرَقَة, a rugged and gravelly plain. جَزَعْتُ, in the sense of traversing and passing through (Zuheyr, Mo'all, 15), also suits *abrâq* in this meaning best. (Of the reading of Vol.

XVI generally it may be said that *خرعت* appears to make nonsense, and that while *شليل* is a word meaning "light and active" applied to a camel, it does not seem appropriate here).

<sup>17</sup> These verses have not been rendered by De Sacy, and we should be glad to know that they were really spurious and not by Lebīd. Verses 4 and 5 accuse er-Rabī' of cowardice, and say that in the press of battle he is like a thing held there by force, and would be glad to escape if he could. In verse 6 he is charged with merely sipping a sip and tasting of the fight *حاس حسوة وذائق*. In verses 7 and 8 the meaning is that if the man who stands next to er-Rabī' in the press and takes him for a bulwark (who to do so must needs be a coward himself) feels him, as one feels a sheep to see if it is fat (*غمن*), he will find that he is lighter and leaner, i. e. more cowardly and chicken-hearted than himself. In the last line is a word, *مطابق*, which is explained in the commentary on the authority of el-Aṣma'i as meaning the action of a beast whose legs are hobbled or shackled, or one walking among thorns: he sets down his forelegs, then he raises them and in the place where they had been puts his hind legs. So here the sense is that er-Rabī' having committed a villainy, returns to the same again.

<sup>18</sup> El-Welīd son of 'Oqbeh. His grandfather was Abū Mo'eyt son of Abū 'Amr son of Umayyeh son of 'Abd Shems; he became a Muslim at the conquest of Mekkah (A. H. 8), and was sent by the Prophet to collect the *Ṣadaqah* or poor-rate from the Benu-l-Muṣṭaliq; having returned with a false report that they had refused to pay it to him, the Prophet ordered arms to be taken up against them: whereupon there was sent down from God this warning verse (Qur. xlix. 6) "O ye that have believed! verily there has come to you a wicked man with news: act therefore with deliberation." 'Omar appointed el-Welīd to be collector of the *Ṣadaqah* from the tribe of Teghlib, and 'Othmān made him governor of el-Kūfah in succession to Sa'd son of Abū Waqqās. One day he was leading the prayers in the great mosque of el-Kūfah, and being drunk, after he had finished turned to the people and said "Shall I give you any more?" This greatly scandalized them, and they reported to 'Othmān his drunken habits. The Khalīfah thereupon removed him from his post and inflicted upon him the legal punishment (*ḥadd*) for drunkenness, viz., eighty stripes. After this he remained in el-Medīneh until 'Alī was proclaimed Khalīfah, when he withdrew to er-Raqqah, a town on the upper Euphrates, where he lived till his death, taking part with neither side in the contest between 'Alī and Mo'āwiyeh. El-Welīd was the uterine brother of the Khalīfah 'Othmān. (Ibn Quteybeh, Ma'ārif, pp. 162-3).

<sup>19</sup> Ghani: the tribe of 'Āmir ibn Ṣa'su'ah to which Lebīd belonged descended (as will be seen from the genealogy with which the notice begins) from Qays son of 'Eylān through his son Khaṣafah. Ghani was the offspring of another son of Qays (or, as others say, his grandson), A'sur. The tribe of Ghani was bound by the ties of mutual protection (*ḡiwār*) to 'Āmir, and a man of Ghani having slain Sha's son of Zuheyr the king of Hawāzin, Khālid, Lebīd's great uncle (see above, note<sup>19</sup>) offered to bear the bloodwit: on Zuheyr refusing to accept anything but the destruction of the offending tribe, Khālid slew him; and this produced an enmity between 'Āmir and 'Abs which was not appeased till many years after on the outbreak of the war of Dāḥis.

<sup>20</sup> In rendering this poem I have ventured, with great diffidence, to take it in a sense exactly opposite ~~to~~ that adopted by De Sacy. He imagines that the words of Ṭufeyl are directed against Ja'far: and he renders the word in line 3 which I translate "to be weary of us," *يملونا*, "*venir à notre secours*," observing however in a note that he would have preferred to read *يبدونا*. This other reading would, however,

be impossible with *لبت* at the end of the verse; and *مله* means "he contracted a loathing of him, he became tired of his society": never, as assumed, "he grieved for him, showed him sympathy." In the next two verses De Sacy takes the subject to be Tufeyl's mother, while it appears to me to be the tribe of Ja'far. Now it is to be remembered that the story is told as a case of Lebid's *boasting* of his former state after he had become a Muslim. Ja'far was Lebid's own family: it is therefore improbable that the verses should be to the discredit of Ja'far; and the whole tenor of the tale and its sequel shews that Tufeyl must be praising Ja'far for some good deeds done him which seemed to the young man of Ghanî, who was accustomed to the orderly administration and public charity which existed under el-Islâm, to be a very trifling thing. It appears to me conclusive that, after reciting the verses, the Ghanawî says *ليت شعري ما الذي رأي من بني جعفر حيث يقول هذا فيهم*. Had the tale been *against* the house

of Ja'far, the phrase would have run *حيث يقول هذا عليهم*. At the same time I should add that it is not impossible that lines 5 to 8 may refer to Tufeyl's mother; a collective family name like Ja'far is frequently construed with a feminine singular: but just before, by a *constructio ad sensum*, it has been construed with a masculine plural, *يلقون*; it may seem unlikely that from the natural *constructio ad sensum* the phrase should revert to the grammatical regimen of the feminine singular, though instances are not wanting. If this be so, then, taking lines 5 to 8 as praise of Tufeyl's mother, reading in line 6 *her* for *their*, and in line 7 *she* for *they*, the result of the passage will be that while the hospitality of Tufeyl's mother is related, that of the Ja'faris is declared to be still more excellent.

<sup>21</sup> "Eighteen years." Tarafch is said to have been six and twenty when he was killed: this earlier age may perhaps refer to the time when he attained distinction as a poet.

<sup>22</sup> El-Mughîrch son of Sho'boh: he was of the tribe of Thaqîf, and nephew of the martyr 'Orweh ibn Mes'ûd; he was a distinguished warrior, and was present at the battles of el-Yemâmeh (when Muscylimch "the Liar" was slain), el-Yarmûk (in A. H. 13, when he lost an eye), el-Lâdisiyyeh (A. H. 15), Meysân, and Nuhâwund (where he led the right wing), besides many others. According to Ibn Quteybeh (Ma'ârif, p. 150) he was made governor of el-Baṣrah, not el-Kûfeh, by 'Omar; and Ibn Khallikân (Do Slane's translation, Vol. IV, pp. 255-258) tells a tale, equally discreditable to 'Omar and el-Mughîrch, of the manner in which the former screened the latter from the punishment due to him on account of a true charge of adultery brought against him during his rule at el-Baṣrah. It seems therefore doubtful whether this anecdote, which makes him governor of el-Kûfeh during 'Omar's reign, can be genuine. I find however that in the index to Froytag's edition of el-Meydânî's proverbs he is said to have been made governor of el-Kûfeh first by 'Omar and afterwards by Mo'âwiyeh; of the latter fact there is no doubt; he died at el-Kûfeh in A. H. 50 of the plague. Ibn Quteybeh mentions (Ma'ârif, p. 276) that he was the first Muslim who took bribes. This story is twice told in the *Aghânî*: it recurs in Vol. XVIII, p. 164, in thô notice of el-Aghleḥ. This poet, who belonged to the tribe of 'Ijl, a sub-tribe of Bekr ibn Wâ'il, was called "the *Râjiz*," or reciter of verses in the *rejes* metre, because he was the first who used that metre for *qaṣîdehs*, or long odes; "before his time" (says Ibn Ḥabîb, quoted by el-Isfahânî) "the Arabs used the *rejes* only in war, in driving camels, in boasting one against another, and on other like occasions, and each poem consisted only of a few couplets. El-Aghleḥ was the first who used it for a *qaṣîdeh*, and after him other men followed in the way he had shewn them." El-Aghleḥ, like Lebid, was very old when

he professed el-Islâm; he left his tribe and settled in el-Kûfeh with Sa'd son of Abû Wuqqâs, and was present at the battle of Nuḥâwend (A. H. 21), where he was among the slain.

<sup>23</sup> The second, or, if we omit the Fâtihah from our reckoning, the first *Sûrah* of the Qur'ân.

<sup>24</sup> إنا هامة اليوم أو غد : That is "I shall be but a *ghost* (*hâmeh*) to-day or to-morrow." It is remarkable that this speech, savouring of the superstitions of the Ignorance, when men spoke of the spirits of dead men as *owls*, should be put into the mouth of so pious a Muslim as Lebîd, especially after the Prophet had specifically denied the existence of the *hâmeh* as of other things regarded with superstitious awe. (See Mes'ûdî, Murtij-eṣ-Ṣāḥab, Vol. III, p. 311). But it will be seen from a discussion elsewhere that this particular superstition (or at least language having reference to it) was by no means eradicated by el-Islâm, and that *hâmeh* was used generally to indicate a dead person even by Muslims.

These words ("I am but an owl of to-day or to-morrow") are given as a proverb in el-Meydânî (Freitag's edn., Vol. II, p. 885) and a history added which connects them with Lebîd's own tribe of 'Âmir. Shuṭeyr ibn Khâlid ibn Nufeyl was taken prisoner by Dirâr son of 'Amr of Dabbeh, who said to him—"Choose one of three things: first, restore to me my son el-Hoseyn, whom thy son 'Otbeh has slain." "I cannot raise up the dead to life," said Shuṭeyr. "Then give up to me thine own son to be slain in his place," said Dirâr. "Nay," replied Shuṭeyr, "the Benû 'Âmir would never agree to surrender a knight valiant in battle for a one-eyed dotard *who is but an owl of to-day or to-morrow*." "Then thou must die," said Dirâr, and bade his son slay him.

<sup>25</sup> For el-Welîd see note (18).

<sup>26</sup> These verses are sufficiently clear. De Sacy supposes that Abû 'Aqîl is the name of a tribe in el-'Irâq which dwelt eastward of el-Kûfeh, so that the breeze that blew from thence would be the East wind: but Abû 'Aqîl is the *Kunyah* or by-name of Lebîd, as will have been noticed from a previous passage in this account of him. "High-nosed" إشم الأنف, having the quality called شمم in the nose: that is, straightness with length and height: it is used to describe a magnanimous man who holds his head high. "Highheaded" إسيد; this word is properly applied to a camel who, by reason of the disease called صيد, is obliged to hold his head up in the air without turning it to right or left: hence it is applied in both a good and a bad sense to a proud and noble man who holds his head high. "Long-armed" طويل الباع, i. e. generous. In the last line De Sacy reads تجارب, while the Bûlâq ed. has تجاذب; the former would mean the East wind's moaning or whistling: the latter the sweeping in different directions of its skirts as it blew.

<sup>27</sup> The Arabic word for "of 'Abd-Shems's line," viz. عشمي, deserves notice as a curious contracted nominal adjective. In lines 5 and 6 the idea is that the camels, which are black—the most precious kind of all (see 'Antarah, Mo'all. 12)—have humps so large (the hump being the most esteemed part of a camel as food—Tarafeh, Mo'all. 93) that they look as if a company of negroes were riding on their backs. Abû Wahb was el-Welîd's *Kunyah* or by-name. *Therid* is a mess of bread crumbled into broth—a much appreciated dish in the simple cookery of the Arabs.

<sup>28</sup> El-Farazdaq, with el-Akhtal and Jerir, made up the famous triumvirate of most excellent poets of the third order, the Islâmîs or those who had seen nothing of the days of the Ignorance.

<sup>29</sup> El-Mo'tasim reigned from A. D. 833 to 842: he succeeded his brother el-Mâmûn, whose reign extended from 813 to 833 A. D.

<sup>80</sup> This most touching and admirable poem has been rendered by Rückert in his translation of the *Hamāsch* (Vol. I, p. 387). In line 2 "mighty towers" is مصانع, plural of مئنة, which has several meanings: "fortresses" is the one which seems to suit the passage best. Line 13 Rückert thinks probably spurious, the insertion of an after-ago. He renders it—

Der Mensch, was ist er anders als was er Frommes denkt ?  
und was sein Gut, als etwas auf Widorruf geschenkt ?

De Sacy understands it as of the fleeting of life—"l'homme ressemble aux bonnes résolutions que suggère la piété." The latter is the preferable sense, though it certainly has a modern tone which is strange to old Arab poetry. Rückert also rejects, as a commonplace interpolation, lines 25 and 26: and certainly 23, 24 and 27, 28 seem to be consecutive in thought. In lines 17, 18 we have proof of Lebîd's already great age when Arbed died, before he became a Muslim; line 18 might be more literally rendered "I am as though, as often as I stand, I were stooping;" *râki* is the posture assumed in prayer when the body is bent at right angles. In line 21 "O go not away from us," فلا تبعدن, is a phrase of frequent recurrence in dirges, and seems to have been used by the wailers at burials in the same way as (but with an exactly opposite sense) the Latin *ilicet*. At the end of the same line I have followed De Sacy and Rückert in taking موعِد meaning "a trysting place" ("un inévitable rendezvous," "unsre Frist der Einigung"): but it may also be rendered (as though pointed موعِد) "threaten-

ing, imminent." I prefer, however, the rendering adopted, as more suitable to the train of thought suggested by فلا تبعدن. Lines 23 and 24 show that Lebîd was still a pagan and a disbeliever in the Resurrection when he uttered the verses. Lines 27 and 28 are quoted and explained by Lane s. v. طارق. The "waiter on the pebble's cast" بالحصى (الطارقة) or الضاربة is the woman who endeavours to obtain an augury by the cast and fall of stones (Rückert "Sandwurfweissagerin"), while the "watcher of the flight of birds," زاجرة الطير, is an augurer of the Roman sort (Rückert "Vogelflug-ausleger"). It would seem that those allusions to divining and the vanity of it are indirect attacks on Moḥammed.

<sup>81</sup> This history relates to the earliest days of el-Islām, before the first Flight, that to Abyssinia in A. D. 615. 'Othmān son of Ma'ṣūn was one of the four converts who embraced the new faith together with 'Abd-er-Raḥmān son of 'Auf (Muir, *Life of Mahomet*, II, 106): he was a man of an ascetic temper, and his austerities caused the utterance by Moḥammed of the precept—"There is no monkery in el-Islām." He led the emigration to the Christian Court of the Nejšāhī (id. II, 133). 'Al-Welîd ibn 'Abī Muḡhīrah was an aged chief of the Qureysh (id. II, 32, 80, 128, &c.) who led in the rebuilding of the Ka'bah after its destruction by a flood in or about A. D. 605. He is believed to be the gainsayer who is cursed in the 74th *Sūrah* of the Qur'ān; he was one of the most violent of the Prophet's opponents, and a witness of his temporary apostacy, when he praised Lāt, 'Ozza, and Manāt.

<sup>82</sup> "The Holy Temple" el-Mesjid-el-Ḥarām, i. e. the Ka'bah.

<sup>83</sup> The rest of this poem is given in the preamble to Lebîd's Mo'allaqah in the edition of the Mo'allaqāt with Persian notes by Rashîdu-n-Nabî of Hûglî. It runs—

"Yea—everything is vain except only God alone,  
and every pleasant thing must one day vanish away!  
And all the race of men—there shall surely come among them  
a Fearful Woe whereby their fingers shall grow pale:

And every mother's son, though his life be lengthened out  
to the utmost bound, comes home at last to the Grave :  
And every man shall know one day his labour's worth  
when his loss or gain is cast up on the Judgment-Day."

These verses have, however, a suspicious Islamic tone, and their genuineness seems very doubtful. The "bleaching of the fingers" *إصفرار الأناامل* in v. 4 is death.

<sup>84</sup> Esh-Sha'bî. His name was 'Âmir ibn Sharâhîl ibn 'Abd-essî-Sha'bî; he belonged to the Himyerite race, and was born in the 6th year of 'Othmân's Khalifate; he was a *Kâtib* (secretary or scribe) to successive governors of el-Kûfeh. According to el-Wâqidî he died in 105 A. H. at the age of 77: others say 104 A. H. This anecdote therefore gives an authority for the attribution to Lobid of the verses referring to his great age which extends to a period only about 60 years after the poet's death. (Ibn Quteybeh, Ma'ârif, p. 229).

<sup>85</sup> "Seventy." As the verses were given before, they were uttered when Lobid's age was ninety.

<sup>86</sup> En-Nâbighah of Dûbyân was one of the foremost poets of the Ignorance: much of his verse is still extant, and has been printed in Ahlwardt's "Diwân of the six Ancient Arabic poets."

<sup>87</sup> According to Ibn Quteybeh Lobid had sons: but when he became a townsman and settled in el-Kûfeh, they returned to their desert life and left him (Ma'ârif, p. 169).

<sup>88</sup> The *Seldm* is uttered at the end of the prayers by the *imâm* and his fellow worshippers; if the worshipper be alone, it is addressed to the angels: if he be praying with others, it is addressed to men and angels together.

<sup>89</sup> "Branches": *غُصُون*; so in the Bûlâq edition. De Sacy reads *غُضُون*, the folds or wrinkles of the body, and understands that these are flattened out by the heavy flags laid over them: but this is not in accordance with the method of burial in use among the Arabs.

<sup>90</sup> These verses are not rendered by De Sacy. "The Mother of the Sons" has been explained before in note (13). The second couplet accords with the renown of Rabî'ah as the "Rabî'at-el-Mo'tarrîfîn" of which we are told at the beginning of the Notice. Who the Abû Shureyk mentioned in the third couplet is I do not know, nor the event (apparently some famous encounter) to which it refers: perhaps it is the great "Day of the Defile of Jebelch." Both this poem and that which follows it must be understood as belonging to the days of the Ignorance, before Lobid (already aged) ceased to compose verse.

### The Mo'allaqah of Lobid.

#### ARGUMENT.

In verses 1 to 11 the Poet describes the deserted abode of his Beloved, where in the Spring her tribe and his had pastured their flocks together; verses 12 to 15 tell of her departure thence for distant fields, named in vv. 17—19. Then the Poet sets forth his view of friendship and the duties of friends when their love cools (vv. 20—21); mentioning his camel as the means of cutting short an acquaintance which has become a burthen, he first describes her hardy frame; then (v. 24) he likens her in her eagerness to start on her way to a cloud heavy with rain, the out-lying portions of which, having emptied themselves of their watery burthen, have hurried away on the moist wings of the South wind. Then follow two other comparisons: the first of the camel to a wild she-ass, driven far away into the wilds by her jealous mate; how these two lived together is told at length (vv. 25—35). The second compares her to a wild cow

whose calf has been killed and torn by wolves, and who wanders restlessly by the outskirts of the pastures away from the herd in search of it; at the end of her wanderings, when she is beginning to be comforted for her loss, she is beset by hunters and dogs, but escapes the former and beats off the latter (vv. 36—52). Then he turns again to his Lady, and tells her more of his mood. He describes to her the revels which she knows not of (vv. 57—61): his open-handedness (v. 62) in clothing the naked and feeding the hungry: his valour in defence of his tribe (v. 63), which gives him again occasion to tell of his good mare (vv. 66—69): his high place in the Courts of Kings, where he is chosen as arbiter between contending poets (v. 70): his liberal hospitality, when he provides for his friends fat camels as the prize of the arrow-gambling (vv. 73—75); and his charity to the poor and friendless, whom he satisfies with food (vv. 76—77). Then he passes from himself to his tribe, and vaunts their nobleness of heart and the valour and steadfastness of their young men and their greybeards (vv. 78—89).

- 1 Effaced are her resting-places—where she stayed but a while and where  
[she dwelt long  
in Mina: desolate are her camps in Ghaul and er-Rijâm,
- 2 And by the torrents of er-Rayyân: the traces thereof are laid bare  
and old and worn, as the rocks still keep their graving:
- 3 Tent-traces over which have passed, since the time that one dwelt there,  
long years, with their rolling months of war and peace.
- 4 The showers of the signs of Spring have fallen on them, and there have  
[swept  
over them the rains of the thundering clouds, torrents and drizzle  
[both—
- 5 The clouds that came by night, those of the morning that hid the sky,  
and the clouds of even-tide, with their antiphons of thunder;
- 6 There have sprung up over them the shoots of the rocket, and in the  
[sides  
of the valley the deer and the ostriches rear their young;
- 7 The large-eyed wild kine lie down there by their young ones  
just born, and their calves roam in herds over the plain.
- 8 The torrents have scored afresh the traces of the tents, as though  
they were lines of writing in a book which the pens make new  
[again,
- 9 Or the tracery which a woman draws afresh as she sprinkles the blue  
over the rings, and the lines shine forth anew thereon.
- 10 And I stood there asking them for tidings,—and wherefore did I ask  
aught of deaf stones that have no voice to answer?
- 11 Bare was the place where the whole tribe had rested: they passed  
[away  
therefrom at dawn, leaving behind them the tent-trenches and the  
[thatch.

- 12 The camel-litters of the tribe stirred thy longing, what time they  
[moved away  
and crept into the litters hung with cotton, as the wooden frame-  
[work creaked
- 13 —The litters hung all round, over their frame of wood,  
with hangings, thin veils and pictured curtains of wool.
- 14 They began their journey in bands, wide-eyed as the wild cows of  
or deer of Wejrah as they watch their fawns lying around.
- 15 They were started on their way, and the sun-nist fell off them, as  
[though  
they were low rocky ridges of Bishoh, its tamarisks and its boulders.
- 16 Nay—why dost thou dwell on the thought of Nawâr? for she is gone,  
and severed is all that bound her to thee, whether strong or weak.
- 17 Of Murrah was she: she halted in Feyd, then she travelled on  
to those of el-Hijâz. How then canst thou reach to her
- 18 On the Eastward slopes of Aja' and Selma, or in Mohajjar  
where Fardeh and er-Rukhâm cut her off from thy coming?
- 19 Or it may be she went to el-Yemen, and then her abode  
should be in Wilâf el-Qahr, or Tilkhâm, in Suwâ'iq.
- 20 Cut short then thy longing for one whose converse is changed to thee:  
and verily the best in affection is he who knows how to cut its  
[bonds.
- 21 Give freely thy best love to him who loves thee—there remains to  
[thee  
the power to flee him when his love limps and its straightness  
[bends to a fall:
- 22 To flee on a camel spent with journeyings, which have left of her  
yet something, her back and hump both thin and spare.
- 23 When her flesh has fallen away, and her flanks grown spare and lean,  
and the strap which ties her shoe to her pastern is cut to pieces with  
[use,
- 24 Then she bends joyfully to the rein, eager to start, as though  
she were a dusky red cloud whose cloudlets drained of rain have  
[sped away on the South wind:
- 25 Or a wild she-ass great with young, mated to a white-bellied male  
[whose sides  
bear the marks of his fights with the stallion-asses, their blows  
[and their bites.
- 26 He takes his way with her to the uplands among the hills, his sides  
[all scarred,  
with jealousy in his heart roused by her rebellion and her desire.

- 27 To the downs of eth-Thelebût, where he scans from the heights thereof  
the wilderness of rolling uplands, in dread lest the guidestones  
[should hide a foe.
- 28 Until, when they come to the end of the six months of Winter,  
they feast their fill on the dewy herbage : and long had they suffered  
[thirst.
- 29 They resolve to turn again, and seek with a steady purpose  
the water-springs : and the way to gain one's end is to set the  
[heart firm !
- 30 Their pasterns were pricked by the awns of the barley-grass, and there  
[swept  
over them the hot blasts of Summer in their swiftmess and their  
[heat.
- 31 And they raised as they galloped along a train of dust whose shadows  
[flected  
like the smoke of a blazing fire with its wood wrapped in ruddy flame
- 32 Fanned by the North wind, its dry sticks mixed with moist stems of  
[' *arfaj*,  
with its volumes of rolling smoke that rise over the tongues of  
[flame.
- 33 He sped along thrusting her before him—a custom it was of his,  
when she lingered behind, to thrust her on in front—
34. And they plunged together by the bank of the rivulet into a pool  
brimming, set close with reeds, and splashed about its waters—
- 35 A pool set round with reeds that screened it from the sun  
those of them that lay in a tangle on its face and those that stood  
[upright.
- 36 Is she like my camel—or shall I compare her to a wild cow who has  
[lost her calf,  
who lingers behind the herd, its leader and its stay ?
- 37 Flat-nosed is she—she has lost her calf, and ceases not  
to roam about the marge of the sand-meadows and cry
- 38 For her youngling just weaned, white, whose limbs have been torn  
by the ash-grey hunting wolves who lack not for food.
- 39 They came upon it while she knew not, and dealt her a deadly woe  
—Verily Death, when it shoots, its arrow misses not the mark !
- 40 The night came upon her, as the dripping rain of 'the steady shower  
[poured on  
and its continuous fall soaked the leafage through and through :
- 41 She took refuge in the hollow trunk of a tree with lofty branches  
[standing apart  
on the skirts of the sandhills, where the fine sand sloped her way.

- 42 The steady rain poured down, and the flood reached the ridge of her  
[back  
in a night when thick darkness hid away all the stars ;
- 43 And she shone in the face of the mirk with a white glimmering light  
like a pearl born in a sea-shell that has dropped from its string.
- 44 Until, when the darkness was folded away and morning dawned,  
she stood, her legs slipping in the muddy earth.
- 45 She wandered distracted about all the pools of Šo'áid  
for seven nights twinned with seven whole long days,
- 46 Until she lost all hope, and her full udders shrunk  
—the udders that had not failed in all the days of her suckling  
[and weaning.
- 47 Then she heard the sound of men, and it filled her heart with fear  
—of men from a hidden place : and men, she knew, were her  
[bane.
- 48 She rushed blindly along, now thinking the chase before  
and now behind her : each was a place of dread.
- 49 Until, when the archers lost hope, they let loose on her  
trained hounds with hanging ears, each with a stiff leather collar  
[on its neck ;
- 50 They beset her, and she turned to meet them with her horns  
like to spears of Semhar in their sharpness and their length
- 51 To thrust them away : for she knew well, if she drove them not off,  
that the fated day of her death among the fates of beasts had  
[come.
- 52 And among them Kesâb was thrust through and slain, and rolled in  
[blood  
lay there, and Sukhâm was left in the place where he made his  
[onset.
- 53 On such a camel, when the glistening sands dance in the hot noon,  
and the skirts of the mirage clothe their rolling hills,
- 54 Will I accomplish my desire—I shall not be turned away from it 'by  
[blame,  
nor by all the reviling that men may care to heap on me.
- 55 And did not Nawâr then know that I am one  
who knits where he pleases the knot of love and cuts it where he  
[wills,
- 56 Wont to leave, when it likes me the places that I care not for  
till the fated doom of Death shall lay hold of a certain soul ?
- 57 Nay, verily thou knowest not how many a night  
cool and mild, good for delight and revelry,

- 58 I have passed as we told tales together : and many a vintner's flag  
have I come to when it had been taken down and his wine grown  
[scarce and dear.
- 59 I buy the costly wine in the old and blackened skin  
or the pitch-anointed jar, when its seal is broken and its wine ladled  
[out.
- 60 Many the clear draught I have drunk in the morn', and many the sing-  
[ing-girl  
to whom I have listened as she strained the strings on the lute  
[which her thumb adjusts.
- 61 I have risen to drink of the wine before the cock crowed at dawn  
that I might drink deep of it again when the sleepers awoke from  
[sleep.
- 62 And many the morning of wind and cold whose chill I have shut out  
when its reins were held in the hand of the bitter North.
- 63 And I too have shielded the Tribe from harm when there bore my wea-  
[pons  
a swift mare, my girdle its reins as I went forth at dawn :
- 64 I mounted the watching-mound on the top of a dusty hill  
narrow in standing-place, whose dust blew towards the standards  
[of the foe :
- 65 Until, when the Sun put forth his hand and laid hold of night  
and the darkness covered all the terrors of our line of fear,
- 66 I came down, and my mare reared up like a lofty trunk of palm  
bare of branches, which the climber can never hope to climb ;
- 67 I pushed her along as the ostrich flees, and swifter than that,  
until, when she became hot with the race and her bones light,
- 68 The light saddle loosened upon her, and her breast streamed with  
[sweat,  
and her girth was soaked through and through with the foam  
[that covered her.
69. She rises in the air, and strives against the rein, and inclines sideways  
like the circling down of a dove when a flight of them flies to drink.
- 70 And many the Court of Kings thronged by strangers who know not one  
[another,  
whose gifts are hoped for by men and their eliding feared,
- 71 Where thick-necked men stood, like lions, threaten'g one another in  
[their hate  
as though they were fiends of the Desert with their feet firm-  
[set in strife—
- 72 I have denied what was vain in their claims, and dealt out to each his due  
as I judged right : and their noblest was not nobler than I.

- 73 And many the camel, prize of the gamers, to whose slaying I have called  
my fellows with the gaming arrows, all alike in length :
- 74 I call them to the slaying of a barren she-camel, or one with young,  
and her flesh has been given freely to all my neighbours ;
- 75 And the guest and the stranger from afar were in my tent  
as though they had come down into Tebāleh with its meadows of  
[rich grass.
- 76 There sought refuge by my tent-ropes every wretched one  
clad in scanty rags and wasted like the camel by her master's  
[grave.
- 77 And they fill brimful with meat, when the winds are blowing shrill,  
great bowls of broth, to which their fatherless ones come to drink.
- 78 Verily we of ' Âmir, when the Tribes are met together,  
there wants not of us a Chief to lead in the doing of a noble deed,
- 79 Or a Divider to portion out to the Tribe its due,  
or a Prince to give less or more as he deems right and good
- 80 In his headship : or a generous man who helps men with his bounty  
free-handed, a gainer of all good gifts and one who takes them by  
[force.
- 81 For he comes of a Stock to whom their Fathers laid down the way  
—and every people has its own way and its leader therein.
- 82 If there comes an alarm, thou shalt find among them the helmets of  
[mail,  
and the hawberks of woven mail the rings of which shine like stars :
- 83 They will not be craven, nor shall their deeds fall without fruit,  
for their hearts are firm and waver not with vain desire.
- 84 Be content with that which the King has allotted to thee as a portion :  
for verily One who knows has portioned out the tempers of men.
- 85 And when faithfulness was dealt out among the Tribes of men,  
the Dealer gave to us a full and abundant share ;
- 86 And He built for us a house of glory with lofty roof  
and our greybeards and our young men have risen to the height  
[thereof.
- 87 They are the Leaders in work when mishap befalls the Tribe,  
and they are its good Knights and they are its Lawgivers ;
- 88 And they are a fair Spring-tide to him who seeks their shelter,  
and to the widows, when their year of widowhood lengthens out ;
- 89 And they are the men to see that no Tribesman holds back in malice,  
and that no vile betrayer goes over to the foe.

## NOTES.

Verse 1. "Minna." There are two places of this name mentioned in the *Marāsid-el-Ittilā'*: the first the well-known valley close by Mekkeh, the second a place in Daryyeh, a province of Nejd, on the route which passes through that country from Mekkeh to el-Baṣrah; the latter is meant here. Ghāul and er-Rijām (that the latter should have the article is proved by a verse of Aus ibn Ḥajr cited by ez-Zauzenī) are the names of two mountains in the same neighbourhood.

v. 2. "er-Rayyān:" this is here the name of a mountain in Daryyeh: it is also the name of a great mountain in the ranges of Aja' and Selma, the mountains of Teyyī', where, according to the *Marāsid-el-Ittilā'*, there is a never-ceasing flow of water; the word means "having abundance of water for irrigation": and it is evident from the name and the mention of torrents here that abundance of water was as characteristic of the er-Rayyān in Nejd as of that in Teyyī'.

v. 3. "Long years": *Hijaj*, plural of *hijjah*; literally, seasons of pilgrimage: as we say "Summers" and "Winters" in the same meaning. "Months of war and peace": in the days of the ancient Arabs the year was divided into four months of peace, in which war between the tribes was by common consent unlawful, and eight months during which war was permitted; the months of peace were Du-l-Qa'deh, Du-l-Hijjah, Moharram, and Rejeb.

vv. 4 and 5. "The showers of the signs of Spring:" *marabih-u-nujūm*: *Mirbā'* is rain that comes in the beginning of the season called *Rabī'* or Spring: *en-Nujūm* are the constellations called *anwā'*, that is, the 28 Mansions of the Moon, which by their rising or setting at dawn were supposed to bring rain or wind, heat or cold (Lane s. v. *مرباع*). *Rabī'* is not strictly Spring; for it includes the whole time from September till March, during which rain falls in Arabia: it is that season when the pastures are fresh and grazing abundant. The commentator on verse 5 divides the year into three seasons, viz., *Shitā'*, *Rabī'*, and *Ṣayf*, or Winter, Spring and Summer; and he says that in the different words used for clouds in verse 5 the rains of the whole year are described: those of Winter fall generally by night, those of Spring in the morning, and those of Summer in the evening. (For an account of the ancient Arabian seasons, see Lane, s. v. *زمن*, and for one of the *anwā'* see Pocock, Spec. Hist. Ar. p. 163.)

v. 6. "The rocket:" *Eyhaqān*, explained as *el-jirjir el-barri*, which is the *Eruca Sylvestris*.

v. 7. "Wild kine." According to Lane (s. v. *بقر*) the animal intended is the antelope *defassa* of modern zoologists, which is still called by this name in Egypt. "It is a species of bovine antelope: in Barbary, it seems that the animal thus called is another species of bovine antelope, or perhaps a variety of the former; it is said to be what is termed by Pallas *antelope bubalis*; by others, *alcephalus bubalis*, or *aeronotus bubalis*; and this is said to come occasionally to the Nile: but the Arabic appellations given above are employed with much laxity."

v. 8. "The comparison of the almost effaced traces of a Spring encampment, washed by the rain and worn by the winds, to lines of writing which have faded by long use is common in old Arabic poetry. Zuheyr says (the lines are quoted in the notice of him extracted from the Aghāni) speaking of tent traces (*ṭulāt*)—

بَلَيْنَ وَتَحْسِبُ آيَاتِهِنَّ عَنْ قَرْنٍ حَوْلَيْنِ رَقًا مُجَدِّلًا

"Worn are they: thou wouldst think their lines  
over which two years have passed were a parchment old and faded."

Another instance is quoted by Lane s. v. <sup>و</sup>سفر. From this it is evident that writing and books were not so strange to the Arabs of the time immediately preceding el-Islām as has sometimes been asserted.

v. 9. The reference here is to the *washm* or tracery pricked into the skin of a woman's hands and arms. The pattern is pricked out with a needle, and there is sprinkled over the skin and rubbed into it a preparation called *na'ūr*, here rendered "blue," i. e. powdered indigo, but which may also mean powdered lamp-black. As the rains which deepened and broadened the traces of the tents are in verse 8 compared to a writer who goes over lines of writing again with a pen, so in v. 9 they are likened to a woman who renews the tattooing by sprinkling fresh pigment over the old lines; which being rubbed in, the lines appear fresh again.

v. 11. "Tent-trenches:" *na'y*, the trench which is dug round a tent to receive the rain draining from its roof and to prevent the flooding of its interior; it is to be remembered that these pastures were resorted to during the season of rain. "Thatch," *Thumām*, i. e. panic grass. Forskal (page 20) says that the name is used for *Panicum Dichotomum*: but it is applied by the Arabs to many species of *panicum*. The grass is used for thatching and for stuffing holes in the tents so as to keep out the weather.

v. 12. "Crept into the litters:" the word used (*takannus*) is appropriate to the action of a hare or a fox creeping into its hole (*kinnās*).

v. 14. *Tūḍīh* is mentioned in v. 2 of the *Mo'allaqah* of Imra' el-Qays. The *Marāsid-el-Iṭīlā'* says that it is the name of "a hill of white sand which rises among other hills of red sand in the great desert (ed-Dahnā) near el-Yemāmech," one of the Southern provinces of Central Nejd: "but others say it is a different place." Wejrah is also mentioned in the *Mo'all.* of I. Q., verse 33: it is a stage on the road from Mekkeh to el-Basrah, 40 miles or 3 stages from the former, much frequented by wild kine. The mention of the look which a wild cow or deer casts on her young one, at which time her eyes are most beautiful and tender, as a comparison for the eyes of a beautiful woman is common in old Arab poetry. See I. Q., *Mo'all.* v. 33.

v. 15. *Bisheh* is the name of a valley in el-Yemen which is thickly populated: also of a village in Tihāmech; so the *Marāsid*: the commentary says that it is a valley on the road to el-Yemāmech. The long line of camels with their litters in which the ladies ride is compared to the ridges of rock of this valley in the part where its ridges are low and sink into the plain (اجزاء). These, in the noon-tide, stand out from the midst of the mirage, with their rocks and tamarisks (*athl*, *Tamariz Orientalis*), even as the tall camel litters make their way through the mists of morn which cling round them like a skirt.

v. 16. "Nawār:" the name of his Love; the word means "timid, retiring."

v. 17. "Of Murrah." There were many tribes of this name: the one intended is, however, probably Murrah ibn Ša'sa'ah, the progenitor of which was the brother of 'Amir son of Ša'sa'ah, father of the tribe to which Lebid himself belonged. These Benū Murrah were more commonly known as the Benū Salūl, and, as stated in the extract from the *Aghānī*, it was among them that the famous 'Amir ibn 'Ufayl died after his unsuccessful attempt to assassinate the Prophet.

Feyd is a place still well known by that name: it was visited by Palgrave (*Central and East. Arab.* Vol. I, p. 230), and is situated on the South-East face of Jebel Solma, the most Southern of the two ranges of Teyyī', about the middle of the range. el-Hijāz, "the barrier" i. e. between the uplands of Nejd and the low coast country of Tihāmech, is the mountainous tract in which Mekkeh and el-Medineh are situated.

v. 18. "Aja' and Selma": in the original *el-jebelân*, "the two mountains:" the two well known ranges, now called collectively Jebel Shaumar, and formerly famous as the country of Teyyi'. They are now inhabited, according to Palgrave (I. 118), by a mixed race, sprung from the union of Teyyi' with 'Abs, Teghlib and Hawâzin, called the Benû Shaumar (or acc. to Wetzstein, Z. D. M. G. XXII, p. 99, Shammar).

el-Mohajjar is given as the name of several places in the Marâsid: here it probably means a hill of the range of Teyyi' which is girt (hojjira) by a stretch of sand. Fardeh is also the name of several places: here it appears to be an isolated hill in Teyyi', called in the Marâsid Fardet-esh-Shumûs. er-Rukhâm (Rukhâm without the article in the Marâsid), a place in Teyyi'.

v. 19. *Suwâ'iq* (in Marâsid, *eş-Suwâ'iq*), a tract in el-Yemen. Of Tilkhâm the Marâsid only knows that it is mentioned here, and Wihâf el-Qahr ("Black rocks of violence") is not mentioned at all.

v. 23. Camels frequently have their soft feet protected by a leather shoe, which is tied by a strap round the pastern.

v. 26. "Her rebellion and her desire." The meaning seems to be that the he-ass's jealousy is roused by the rebellion of the female before her pregnancy and her desire thereafter, which makes him suspect that she may not be with foal by him.

v. 27. *eth-Thelebût*, a *wâdi* 'between Teyyi' and ðubyân, South-East of the range of Selma. "The guidestones": *ârâm*, plural of *irem*, stones or cairns set up to mark the way in the desert.

v. 28. "The six months of winter:" *Jumâda sittetan*. According to ez-Zauzenî, *Jumâda* is here put for *esh-Shitâ*, winter, as in the verse of the *ilamâsch*—

"In a night of *Jumâda*, the season of cold and rain,

when the camp-dog cannot see the tent-ropes for the darkness thereof."

Others say that he divides the year into two halves of six months each, and that *Jumâda* is taken in its ordinary meaning, the name of a month, as the last month with which the Winter season ends; there are two *Jumâdas*, the first and the second, respectively the fifth and sixth months of the Arabian year: the second would be meant here. The verse means that during the cool season of dews and rain the two wild asses had satisfied themselves with the grass of the pasture, and had had no need of water, from which they had abstained all this time: then the Summer set in, and the pasture withered, so that they had to resort to the water in the deep valleys.

v. 29. The literal version of this couplet is—

"The two returned with their affair to a strongly set (purpose)

firmly determined: and success in plans is the fixing of them firm."

I have added in my translation what is understood,—that their purpose was to seek for water.

v. 32. '*Arfa*,' a shrub much used for fuel: its botanical name is not given by Lane, nor does it occur in Forskûl.

v. 36. "Who has lost her calf:" *mesbû'ah*, more fully "whose calf has been torn and slain by beasts of prey (*sabo*)."

v. 37. "Flat-nosed:" more accurately "camoys-nosed," *khaned*, an epithet reserved for kings and deers. "The sand-meadows": *esh-Shaqâ'iq*, plural of *Shaqiqah*, an intervening space or tract between two elongated tracts of sand, producing good herbage.

v. 38. "Youngling just weaned:" so I have rendered *mo'afar*, following the commentary, which explains that it means "cast down in the dust" (*'afar*), and is applied to the young of an animal which is suckled by its dam and then left for a day or two to find its own food, so as to wean it gradually. The mother tumbles over the

calf in the dust when it desires to suck and prevents it from doing so. "White:" *qaḥd*. The wild kine are white, except the face and legs and tail, which are black: so says the commentator here. Imra'el-Qeys (Mo'all. 64) compares them to onyx stones.

v. 43. "A pearl born in a sea-shell:" *jumānet-el-baḥriy*. *Jumāneh* is properly a false pearl, or a bead of silver shaped like a pearl, from the Persian *gumān*, thought, fancy: here it is put for a genuine pearl, as is shewn by the following word *el-baḥriy*, which may be either the shell or the diver. "That has dropped from its string:" *sulla niḡāmukā*: literally "of which the string has been pulled out:" the restless roaming of the cow is likened to the rolling hither and thither of the pearl.

v. 45. No information is given in the Marāṣid regarding Ṣo'āid.

v. 46. The commentary says that the apodosis of *ḥattā iḏā* in this verse, *viz.*: *selet 'anhu* (she forgot her young one), is omitted: I prefer to understand verse 47, though introduced by *wa*, as the apodosis. A similar construction exists in verse 49: *ḥattā iḏā ya'isa-r-rumātu, wa arsalū*.

v. 47. "The sound:" *rizz*, "a noise heard from afar." "From a hidden place:" "An ḡahri gheybin," "from a place which concealed what was in it".

v. 48. In rendering this couplet the reading *فعدت* has been chosen instead of *فعدت*; the former is cited in the notes to Arnold's edition (p. 29) from the Gotha MS.: the latter appears in his text. The native commentators prefer the latter, apparently because the construction of *عد* as an *اخذت كان* is thought the most appropriate explanation of the verse: but *عد* from *عدو* to run would be equally admissible as regards construction, *تسبب* being its *حال*, and the sense seems to require the word; for the next verse says that the pursuers lost hope of reaching her, evidently because of her swift flight. Taking *عدت* as the first word, the verse may be literally rendered

"She rushed along, thinking that each of the two openings  
was a meet place for fear, both behind her and before her".

"The two openings," *kila-t-farjeyn*: that is, the splitting of the thicket which opens before her and closes behind her as she rushes along: it is equivalent to the following words, *khalfuhā wa-imāmuhā*. *Maula* "a meet and fitting place," as in the Qur'an, "*en-nāru maulākum*," "The Fire is your fitting place."

v. 49. "With stiff leather collars on their necks:" *Qāfilan a'ḡāmuhā*. Another rendering of these words, which is the one preferred by De Sacy, is "lean and slender-waisted" (aux flancs maigres et effilés); *qāfil* means dry, and *a'ḡām*, plural of *'aḡmah*, is *snjd* to mean waist as well as leather collar. The latter meaning, however, is the only one of the two given in Lane.

v. 50. "Spears of *Semhar*." According to the commentary and other authorities quoted by Lane, *Semhar* was the name of a certain maker of spears who dwelt in the town of el-Khatt in el-Baḥreyn, where the best bamboos from India were landed and fashioned into lances, which are thence frequently called *khaffiy*: he is said to have been the husband of Rudeynch, who also used to straighten spears; others say that *Semhar* was the name of a town or village in Abyssinia where good spears were made. But it will be seen from Lane (s. v. *سمهر*) that there is a quadrilateral verb *سمهر* meaning "to be straight and hard," and that *semhariy* is applied to bow strings as well as spears, while *musmahirr* is used of a thorn in the sense of tough. In this verse there is another appellative, *Medariyyeh*, that is, belonging to or made at Medar, a vil-

lage in el-Yemen twenty miles from San'â (Marâsîd), which also means spears (*i. e.* long and sharp horns), spears being made there as well as at el-Khatt.

v. 52. Kosâb and Sukhâm, names of two of the hounds.

v. 56. "A certain soul:" *ba'da-n-nufûs*, *i. e.* himself. This verse affords an interesting example of the archaic use of *و* as the equivalent of *لا* ( *لا* ) *i. e.* unless. Having the force of "if not," it causes the verb to take the jussive or apocopated form required in the protasis of a conditional sentence.

v. 58. "As we told tales together": the Arabic verb *samara* means to pass the night in drinking wine and holding pleasant discourse together. "Vintner's flag:" the shops (*dukkân*) of the wine-sellers were distinguished by flags hung out before them; when the flag was taken down it was a sign that the shop was closed or that the wine had run out. In this verse and the next Lebîd vaunts his liberality in buying wine for his fellows when it was at its dearest. So 'Antarah (Mo'all. 52), describing a gallant man, calls him *hattaku ghayâti-t-tijâr* "one who pulls down, or causes to be taken down, the vintners' flags," *i. e.* exhausts their stock.

vv. 60, 61. The morning draught of wine is praised above all others by the ancient poets. In the work entitled *el-Marj-en-naqir* ("the green meadow") Mohammed ibn Abi Bekr el-Uyûnî says of the *ṣabâḥ* or morning potation—"The poets make mention of the morning draught in preference to wine drunk at other times, because in ancient times Kings and others used to prefer drinking in the morning, and because of the freedom of the heart at that time from care or thought of the obstacles and calamities of Fortune; also because those that arose early to drink anticipated those who blamed their wantonness: for it is the custom of the blamer to blame a reveller in the morning for what he has done the night before, because that is the time when he becomes sober and recovers from his drunken fit." (Quoted from Kosegarten, Mo'all. of 'Amr Kulth. p. 49.)

v. 62. A singing girl." The singing girls who sang at the drinking parties of the ancient Arabs were Greeks, Syrians, or Persians; until after el-Islâm the Arabs, though masters of rhythm and metre, had no indigenous system of singing except the rude song (originally of the camel-driver) called *rajz*. These girls probably sang for the most part in their own tongue and played the music which they had learned in Persian 'Irâq or Syria; but in the life of en-Nâbighah of Duhyân as given in the Aghânî (IX. 161) a singing-girl of Yethrib (afterwards el-Medîneh) is mentioned, who sang one of that poet's poems in Arabic and so enabled him to detect a fault of prosody.

v. 62. "Whose chill I have shut out," *i. e.* by gifts of clothes and food to the naked and hungry. The phrase "when its reins were in the hand of the bitter North" means that the North, the coldest of winds, had full control over the day.

v. 63. "My girdle its bridle": he threw the bridle over his shoulders so that it became a girdle to him, in order that he might have his hands free for his weapons.

v. 64. The dust blew from the hill-top where he acted as scout on to the Enemy's banners: this indicates that they were close at hand and that his post was one of danger.

v. 65. "The terrors of our line of fear:" *'aurât-eth-thughâr*. *'Aurât* means the dangerous or undefended portions of a place open to attack; and *thughâr*, plural of *thaghr*, is the frontier over which the enemy spreads his line of assailants. When the sun sets, and watching at the place of observation is of no further use by reason of the darkness, Lebîd comes down and scouts the plain between his Tribe and the foe, to see that no night attack is being prepared by the latter.

v. 66. In this verse the word *جدم* is used of the trunk of a palm tree which is still an object of desire to the gatherer of the fruit, but is so tall that he cannot hope to climb it: it is thus evident that the word is *not*, as stated by the authorities quoted in Lane *s. v.*, restricted to the trunk of a palm tree after it has become dry or has lost its head of leaves and fruit.

v. 68. "Light saddle:" *rihāleh*, a saddle made only of sheep-skin and wool, without any frame of wood, used by swift riders.

vv. 70—72. In these verses, says the commentator, he boasts of the contention which passed between him and er-Rabī' son of Ziyād at the court of en-Nu'mān son of el-Munḍir king of el-Hīreh. The circumstances of this contest are related in the notices of both poets given in the Kitáb el-Aghání.

v. 71. "Friends of the Desert:" *jinnu-l-bedīy*. *El-Bedīy* may be either the proper name of a certain valley, or it may be synonymous with *el-bādiyeh*, the Desert generally.

v. 73. The custom of the Arabs in gambling with arrows was to require those who lost to pay for the camel which was the prize of those who won: Lebīd's liberality consisted in that he furnished the prize himself from his herds, and thus those who lost had not to pay.

v. 74. A *barra* camel, says the commentary, is the fattest, while one with young is most delicate of flesh.

v. 75. *Tebāleh*, a certain valley in el-Yemen, famous for its abundance of water and rich meadows. In this valley was situated the Oracle of Ḍu-l-Khulūṣah, consulted by Imra'el-Qeys after the slaying of his father.

v. 76. "The camel by her master's grave:" *el-bedīyyeh*. It was the custom of the pagan Arabs to tether a camel by the grave of a dead warrior, and to let her die there of hunger and thirst; they believed that on the Judgment Day her master would ride on her at the Resurrection to the gathering of mankind. The root *bedā* means to be worn out.

v. 77. "They fill brimful with meat:" literally, *they crown*, as in Greek (II. I, 470) *κρητῆρας ἐπιστέφαντο ποτοῖο*, and (II. VIII, 232) *κρητῆρας ἐπιστέφαν οἶνοιο*. "Bowls:" *khuluj*, plural of *Khalij*, a river or canal, used to mean great and well-filled bowls.

v. 80. "A gainer of all good gifts and one who takes them by force:" *Kashūn raghā'ibin ghannāmuhā*: this does not mean that the generous man, like the Vikings, was bounteous from the wealth he had acquired by plunder; the "good gifts" are his noble qualities; and to gain them by force is to improve them by strenuous and noble deeds.

v. 87. "Lawgivers:" *hokkam*, *i. e.* judges, deciders of disputes, and layers down of the law; all these functions, as in Homeric times, were among the ancient Arabs combined in one man of tried steadfastness and honesty.

v. 88. "A Spring-tide." As the season of *Rabī'* or Spring was the pleasantest of the year, rich with fertilizing rains and green pasture, so men of bountiful and kindly nature were likewise called by that name. Lebīd's own father Rabī'ah, as the Aghání informs us, was known as *Rabī'at-el-Mo'tarrin i. e.* "a Spring for those who came to seek his bounty."

"Their year of widowhood." The commentator quoted by Arnold (not ez-Zauzenī) says that in the Ignorance it was the custom for widows on the death of their husbands to undergo a period of separation (*iddah*) extending to one year. Under el-Islām the *iddah* was fixed (*Sūrat-el-Baqarah*, verse 234) at four months and ten days. During this

period they could not marry again nor go forth from their houses, and were thus most miserable. Reference appears to be made to this ante-islamic custom in v. 240 of the *Shrat-el-Baqarah*.—"Such of you as shall die and leave wives shall bequeath their wives a year's maintenance without causing them to leave their houses." That the period of mourning in the Ignorance was a full year, not for widows only but for the whole family of the deceased, may be gathered from the verses of Lebîd on his own death quoted near the end of the notice of him in the Aghânî, where he bids his daughters mourn for him—

إِلَى الْحَبْرِ ثُمَّ اسْمُ السَّلَامِ عَلَيْكُمَا      وَمَنْ يَبْكُ حَوْلَ كَامِلٍ فَقَدْ اعْتَدَرَ

"Until the ~~year~~ is done—then the name of Peace be on you:

for he who weeps for a year has discharged what is due from him."

Ez-Zauzonî, however, takes *murmilat* as meaning merely "poor women" *النساء اللواتي* and refers the lengthening of their year spoken of to the weariness of their life of poverty.

v. 89. The commentator quoted by Arnold explains *humu-l-'ashireh* as equivalent to *hum muḥlihu-l-'ashireh*: "They are the men who order or rule the tribe." Ez-Zauzonî and the Persian commentator Rashîdu-n-Nabî, however, reject so violent an ellipse and take the verse in the simpler construction which I have followed. Of the use of *وَلَا* in the negative sense which it bears here (= lest) other examples are to be found in the Mo'allaqah of 'Amr son of Kulthûm, vv. 25 and 32.



*H. Rivett-Garnac, del.*

*J. Schaeffer, lith.*

VIEW OF THE GORGE NEAR CHANDESHWAR, KAMAON,  
WITH SOME OF THE CUP-MARKS.





H. Rivett-Carnac del.

J. Schaumburg Lith.

### ANCIENT ROCK SCULPTURINGS IN KAMÁON.

*The rock is at an angle of about 45°. The large markings are a little more than 3 in. in diameter and  $\frac{1}{2}$  in. in depth, but they are weatherworn and not so distinct as in the sketch.*



# JOURNAL

OF THE

## ASIATIC SOCIETY OF BENGAL.

Part I.—HISTORY, LITERATURE, &c.

No. II.—1877.

*On the Shighni (Ghalchah) Dialect.—By R. B. SHAW, Political Agent,  
Ladàk.*

A few words of the Shighni dialect, collected by Munshi Faiz Bakhsh, were attached to my former paper on the Ghalchah Dialects printed in the Journal of the Asiatic Society of Bengal, Pt. I, for 1876. I see that the late Oriental Congress held at St. Petersburg expressed the opinion that a study of the forms of speech in use about the head-waters of the Oxus was very desirable. I hope therefore that this short grammar and specimen story of a third of those dialects may be acceptable.

Shighnàn and Roshàn, the districts where it is spoken, lie in the valley of the Oxus just above the country of Darwàz, on the great bend which the river takes round Badakhshàn. They extend also up the valleys of some of its feeders which descend from the Pamir. They are both under the same Ruler (*Asaf Ali Khan* is the name of the present Mir). His dominions form the most northerly of the Hill-States dependent on Afghànistàn. My informant (a Shighni) saw him go, some six years ago, to do homage at Faizabad to Naib Muhammad Alam, the Governor of Afghàn Turkistàn. The next year, his son went on a similar errand, since which my informant has been absent from his country. On both occasions tribute was taken : 2000 *tillas* (gold coins), 1000 *yàmbu* (Chinese shoe-silver) &c. These are probably mere round figures used to express a considerable (and unknown) amount ; for these two items alone would be worth about £18,000. The next district to the north, Darwàz, is represented as being subordinate to Bokhàrà. Shighnàn was not invaded by the Afghàns, but followed natural-

ly the destiny of the mother province, Badakhshàn, to which it has been, from time immemorial, attached. The former seems to be the most important of the Ghalchah States, and wonderfully protected from invasion by natural advantages.\* It would thus form a safe refuge for an aboriginal people.

The valleys of the Oxus feeders which form the greater part of the territory of Shighnàn and Roshàn, open out at their heads into the high plains of Pamir. It will be observed that the Shighni dialect shows a greater affinity to that of Sariḳol (in the Eastern side of Pamir) than to the speech of the Wakhis, notwithstanding that the latter occupy a valley on the same side of the main water-parting, and parallel with the Shàkh-Darrah (Shighnàn). This would show that the open Pamirs must have opposed less serious obstacles to inter-communication than the Western ridges which divide the Oxus feeders from one another, or than the narrow gorge of that river itself. Its local name "Panjah," suggests the illustration of a hand with fingers outspread (as in playing the piano). It is obviously easier (comparing small things with great) to cross the level back of the hand, than to travel at right angles across the arched fingers.

The Shighni dialect has all the sounds known in the other Ghalchah dialects with the addition of one which is intermediate, and seems to explain the transition, between the Persian *sh* and the Sariḳoli *kh* (as in German *ich*). It will have been noticed that many Persian words such as *shab*, *sharminda*, *Pàdshàh*, become in Sariḳoli *khâb*, *kharminda*, *Pâdkhâh*, &c. The Shighni supplies the intermediate step by a sound which I do not know how to express (without special type) better than by the compound *skh*. It is the German *ch* of *ich* sibilated so as almost to resemble an English *sh*. The steps are plain from the *sh* pronounced at the back of the upper teeth with the front part of the tongue, to the *skh* a little further back with the middle part of the tongue raised, and to the Ghalchah *kh* slightly further back still. This *skh* is unlike the Wakhi *sch*; for while the former is an attempt to sibilate the *kh*, the latter is an *sh* pronounced at the back of the palate, with the tongue curled back.

#### THE SUBSTANTIVE.

| Singular.                                       |            | Plural.                     |
|-------------------------------------------------|------------|-----------------------------|
| N. <i>chîd</i> ,.....                           | a house    | <i>chîden</i> ..... houses  |
| G. <i>chîd</i> ( <i>chîd</i> -END G. Abs.),     | a house's  | and so on all through, with |
| D. <i>chîd</i> -ER or -ERD or AR- <i>chîd</i> , | to a house |                             |

\* See the account of Abdu'l-Subhân, given by Capt. Trotter R. E., in the Report of the Yarkand Mission, 1873-4.

|                                            |                             |                                                             |
|--------------------------------------------|-----------------------------|-------------------------------------------------------------|
| Acc. <i>chíd</i> or <i>chíd-ER</i> , ..... | a house                     | the addition of the same post-positions as in the singular. |
| Loc. <i>chíd-TI</i> ,* .....               | on or to a house            |                                                             |
| <i>chíd-ANDE'</i> , .....                  | in or into a house          |                                                             |
| PIS <i>chíd</i> , .....                    | on or to or towards a house |                                                             |
| MI <i>chíd</i> , .....                     | in a house                  |                                                             |
| TAR <i>chíd</i> , .....                    | into, on to or to a house   |                                                             |
| Abl. AZ <i>chíd</i> , .....                | from a house                |                                                             |
| <i>chíd KATTI</i> , .....                  | with a house                |                                                             |
| <i>chíd-ITS</i> , .....                    | as far as a house           |                                                             |

## THE PRONOUNS.

## 1st Person.

## SINGULAR.

|                                          |             |
|------------------------------------------|-------------|
| N. <i>wuz</i> , .....                    | I           |
| G. <i>mu</i> (G. Abs. <i>mu'nd</i> )     | my, (mine)  |
| D. <i>mu'rd</i> or <i>mur</i> , .....    | to me       |
| Acc. <i>mu</i> , also <i>mur</i> , ..... | me          |
| Loc. <i>tar mu</i> &c., .....            | at me, &c., |
| Abl. <i>az mu</i> , .....                | from me     |

## PLURAL.

|                                        |             |
|----------------------------------------|-------------|
| <i>màsh</i> , .....                    | we          |
| <i>mùsh</i> (G. Abs. <i>màsh-end</i> ) | our, (ours) |
| <i>màsh-ard</i> or <i>-ar</i> , .....  | to us       |
| <i>màsh</i> , .....                    | us          |
| <i>tar màsh</i> , &c., .....           | at us       |
| <i>az màsh</i> , .....                 | from us     |

## 2nd Person.

|                                          |              |
|------------------------------------------|--------------|
| N. <i>tu</i> , .....                     | thou         |
| G. <i>tu</i> (G. Abs. <i>tu'nd</i> )     | thy, (thine) |
| D. <i>tu'rd</i> or <i>tur</i> , .....    | to thee      |
| Acc. <i>tu</i> , also <i>tur</i> , ..... | thee         |
| Loc. <i>tar tu</i> , .....               | at thee      |
| Abl. <i>az tu</i> , .....                | from thee    |

|                                         |               |
|-----------------------------------------|---------------|
| <i>tamà</i> , .....                     | ye            |
| <i>tamà</i> (G. Abs. <i>tamà'nd</i> )   | your, (yours) |
| <i>tamà'rd</i> or <i>tamà'r</i> , ..... | to you        |
| <i>tamà</i> , .....                     | you           |
| <i>tar tamà</i> , .....                 | at you        |
| <i>az tamà</i> , .....                  | from you      |

## 3rd Person.

## Masculine and Neuter.

|                                                 |          |
|-------------------------------------------------|----------|
| N. <i>yü</i> or <i>yid</i> , .....              | he, that |
| G. <i>wi</i> or <i>wum</i> (Abs. <i>wi'nd</i> ) | his, of  |
|                                                 | that     |

|                                     |               |
|-------------------------------------|---------------|
| <i>wàdh</i> , .....                 | they          |
| <i>wief</i> (Abs. <i>wief-end</i> ) | their, theirs |

(? *yü* when the governing noun is in the nominative)

|                                                |         |
|------------------------------------------------|---------|
| D. <i>wi'rd</i> or <i>wir</i> , <i>wum-ird</i> | to him, |
|                                                | to that |

|                                       |         |
|---------------------------------------|---------|
| <i>wief-èrd</i> or <i>-er</i> , ..... | to them |
|---------------------------------------|---------|

\* This forms another resemblance with the Dard, (Arniya) in which dialect also he affix *té* signifies 'to.'

|                                                           |                   |                        |           |
|-----------------------------------------------------------|-------------------|------------------------|-----------|
| Acc. <i>wi</i> also <i>wi'r</i> , .....                   | him, that         | <i>wief</i> , .....    | them      |
| Loc. <i>wi-té</i> , <i>tar-wi</i> , <i>tar-òd</i> , ..... | at him or         |                        |           |
|                                                           | that              | <i>wief-té</i> , ..... | at them   |
| <i>wum-andé</i> , <i>yum-andé</i> , .....                 | in him or         |                        |           |
| &c., .....                                                | that              |                        |           |
| Abl. <i>az-wi</i> , <i>az-um</i> , .....                  | from him, or that | <i>az wief</i> , ..... | from them |

## Feminine.

|                                                                                                         |              |                    |
|---------------------------------------------------------------------------------------------------------|--------------|--------------------|
| N. <i>ya</i> , .....                                                                                    | she          | Same as Masculine. |
| G. <i>wam</i> or <i>wu-am</i> ( <i>ya</i> , ? when<br>the governing noun is in<br>the Nominative) ..... | of her       |                    |
| D. <i>wam-ird</i> , .....                                                                               | to her       |                    |
| Acc. <i>wam</i> , <i>yiwam</i> , .....                                                                  | her          |                    |
| Loc. <i>tar wam</i> &c., .....                                                                          | at her, &c., |                    |
| Abl. <i>az wam</i> , .....                                                                              | from her     |                    |

## SUBSTANTIVAL PRONOUN.

|                                            |             |                                                  |          |
|--------------------------------------------|-------------|--------------------------------------------------|----------|
| N. <i>yem</i> or <i>yam</i> , .....        | this one    | <i>màdh</i> or <i>dath</i> , .....               | these    |
| G. <i>mi</i> or <i>di</i> , .....          | of this one | <i>mef</i> or <i>def</i> (Abs. <i>mef-end</i> ), | of these |
| D. <i>mi'rd</i> or <i>ar-am</i> , .....    | to this one | <i>mef-erd</i> or <i>-er</i> , .....             | to these |
| Acc. <i>mi</i> or <i>di</i> , .....        | this one    | <i>mef</i> or <i>def</i> , .....                 | these    |
| Loc. <i>tar-am</i> , &c., to this one, &c. |             |                                                  | &c.      |

The Adjectival Pronouns *that* and *this* are the same as the above Pronouns of the 3rd Person.

The following emphatic forms have also been found: *ik-yid*, *ik-wi* and *ik-yuwi* "that same", *ik-yiwam* "that same she"; *ik-wid-und* "of that same" (G. Abs.), *ik-yam*, *ik-wam* "this same."

The following pronouns seem to be declinable without internal change: *chiz* "what?", *kà* "what?", *tsèi* "whatever", *chi* or *chài* "who"? or "what"?

## REFLECTIVE PRONOUN.

## Singular and Plural.

|                                     |                                       |
|-------------------------------------|---------------------------------------|
| N. <i>khu</i> , .....               | I, thou, he, my-, thy-, him-self, &c. |
| G. <i>khu</i> (Abs. <i>khu'nd</i> ) |                                       |
| D. <i>khu'rd</i>                    |                                       |
| Acc. <i>khu</i>                     |                                       |
| Loc. <i>khu-ti</i> &c.              |                                       |
| Abl. <i>az khu</i>                  |                                       |

*khu-bath* = by himself, &c.

The set of separable terminations or pronouns belonging to the Past Tenses of Verbs is more perfect and normal than in Wakhi and Sariḳoli.

## SINGULAR.

1. *am* or *um*
2. *at*
3. *i* or *é*

## PLURAL.

- am*
- et*
- en*

These terminational pronouns are used precisely like common pronouns (nominative only); but they can be placed immediately after the verb (as terminations) as well as in other parts of a sentence and in addition to the ordinary personal pronouns. The Past Tenses which employ them seem not yet to have reached the purely inflectional stage.

## VERBS.

The conjugation of the Verbs resembles the Sariḳoli more than the Wakhi. The Infinitive is in *ao*, and the declension of the Verbal Substantive is effected with the Root (deprived of the *ao*) as well as with the full Infinitive form. In other words the Nominative and Accusative of the Verbal Substantive add the syllable *ao* to the Root form, and other cases add their own respective terminations either to the Root or to the Nom. form.

## CONJUGATION OF THE VERB 'TO TAKE'.

(i.) Root form: *zekht*; (ii) Present form: *zez*; (iii) Past form: *zokht*.

|                                          |                                                               |                                                                |
|------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|
| Verbal Substantive; Nom. and Acc. cases: | <i>zekht-ao</i>                                               | the taking - .                                                 |
| Gen.                                     | <i>zekht<sub>1</sub></i>                                      | of taking                                                      |
| Dat.                                     | <i>zekht-ir</i><br><i>zekhtao-ir</i>                          | } to or for taking                                             |
| Abl.                                     | <i>az zekht</i>                                               |                                                                |
| Loc.                                     | <i>zekhtao-té</i><br><i>zekht-its</i><br><i>tá zekhtao-ir</i> | from taking<br>on or in taking<br>whilst taking<br>till taking |

## IMPERATIVE.

**ZEZ** or *zézé* take thou      *zez-id* take ye

## INDICATIVE MOOD.

## PRESENT FUTURE TENSE.

|     |    |                                                    |             |
|-----|----|----------------------------------------------------|-------------|
| S.  | 1. | <b>ZEZ-<i>am</i></b> (in some verbs, <i>-um</i> )  | I take      |
|     | 2. | <b>ZEZ-<i>é</i></b> (in some verbs, <i>-yé</i> )   | thou takest |
|     | 3. | <b>ZEZ-<i>d</i></b>                                | he takes    |
| Pl. | 1. | <b>ZEZ-<i>am</i></b>                               | we take     |
|     | 2. | <b>ZEZ-<i>id</i></b> (in some verbs, <i>-yid</i> ) | ye take     |
|     | 3. | <b>ZEZ-<i>in</i></b> (in some verbs, <i>-yin</i> ) | they take   |

## IMPERFECT TENSE.

ZOKHT-IRD (*am*) *vòd*, ..... I was taking (lit. to the taking I was)  
&c., with the pronoun terminations (see Past Tense).

## PAST TENSE.

- S. 1. ZOKHT (*am*), ..... I took  
 2. ZOKHT (*at*) ..... thou tookest  
 3. ZOKHT (*i*) [sometimes *é*] ..... he took  
 Pl. 1. ZOKHT (*am*) ..... we took  
 2. ZOKHT (*et*) ..... ye took  
 3. ZOKHT (*en*) ..... they took

## PERFECT TENSE.

ZOKHTJ (*am*). ..... I have taken  
 &c. &c. •

## PLUPERFECT TENSE.

ZOKHTJ-IT (*am*), ..... I had taken  
 &c. &c.

## CONDITIONAL MOOD.

ZOKHTJ-INJ *vây-am*, ..... I may take, *or* have taken (lit. I may be  
 &c. taking *or* having taking).

*Tsa* is used as a prefix before verbs in the Indicative Mood to give them a Conditional or Subjunctive tense.

## CONJUGATION OF THE VERB 'TO GO' OR 'TO BECOME'.

(i.) Root form: SIT; (ii) Present form: SÁO; (iii) Past form: SUT  
 or SAT, (iv) Perfect form: SUDILJ.

Verbal Substantive: Nom. Acc. SIT-ao &c.

## INDICATIVE MOOD.

## PRESENT FUTURE TENSE.

Singular.

Plural.

1. SÁO-*am*, ..... I go *or* become SÁO-*am* ..... we go &c.  
 2. SÁO-*i*, ..... thou goest &c. SÁO-*id* ..... ye go &c.  
 3. SÓD (for SÁO-*d*) he goes &c. SÁO-*in* ..... they go &c.

## IMPERFECT TENSE.

SIT-IRD (*am*) *vòd*, ..... I was going &c.  
 &c. &c.

## PAST TENSE.

SUT (*am*) or SAT (*am*), ..... I went &c.  
 &c. &c.

## PERFECT TENSE.

|                      |       |                 |
|----------------------|-------|-----------------|
| SUDHJ ( <i>am</i> ), | ..... | I have gone &c. |
| &c.                  |       | &c.             |

## PLUPERFECT TENSE.

|                         |       |                |
|-------------------------|-------|----------------|
| SUDHJ-IT ( <i>am</i> ), | ..... | I had gone &c. |
| &c.                     |       | &c.            |

## CONDITIONAL MOOD.

|                           |       |               |
|---------------------------|-------|---------------|
| SUDHJ-INJ <i>vây-am</i> , | ..... | I may go or   |
| &c.                       |       | have gone &c. |
|                           |       | &c.           |

## CONJUGATION OF THE VERB 'TO BE'.

(i.) Root form: VID; (ii) Present form: VÁY; (iii) Past form: VÔD; (iv) Perf. form: VUDHJ.

Verbal Subst. Nom. and Acc. VID-ao

&c.

## INDICATIVE MOOD.

## PRESENT FUTURE TENSE.

|        |                |                      |       |                |
|--------|----------------|----------------------|-------|----------------|
| S. 1.  | VÁY- <i>am</i> | [YAST ( <i>am</i> )] | ..... | I may be or am |
| 2.     | VÁY- <i>é</i>  | [YAST ( <i>at</i> )] |       | &c.            |
| 3.     | VE'D           | [YAST ( <i>'</i> )]  |       |                |
| Pl. 1. | VÁY- <i>am</i> | [YAST ( <i>am</i> )] |       |                |
| 2.     | VÁY- <i>id</i> | [YAST ( <i>et</i> )] |       |                |
| 3.     | VÁY- <i>in</i> | [YAST ( <i>en</i> )] |       |                |

## PAST TENSE.

|                   |       |       |
|-------------------|-------|-------|
| VÔD ( <i>am</i> ) | ..... | I was |
| &c.               |       |       |

## PERFECT TENSE.

|                     |       |             |
|---------------------|-------|-------------|
| VUDHJ ( <i>am</i> ) | ..... | I have been |
| &c.                 |       |             |

## PLUPERFECT TENSE.

|                        |       |            |
|------------------------|-------|------------|
| VUDHJ-IT ( <i>am</i> ) | ..... | I had been |
| &c.                    |       |            |

## CONDITIONAL MOOD.

|                         |       |             |
|-------------------------|-------|-------------|
| VUDHJ-INJ <i>vây-am</i> | ..... | I may be or |
| &c.                     |       | have been.  |

In the Past Tenses the pronominal termination of the 3rd person singular (*é* or *i*) is often used separately like those of the other persons, unlike the rule in Wakhi and Sariḳoli.

E. g. *idis i chùd* = thus he did.

*idis am chùd* = thus I did.

The Negative affixes are *nà* or *né* and *mà* as in the other Ghalchah dialects; *mà* is used with the Imperative and Optative, and *nd* or *nè* with the other moods.

In compound verbs the former is used in the form of the root (sometimes in the Acc. or Dative of the Verbal Substantive) and the latter in the appropriate Tense.

- E. g. 1. *pedhed-ir sut* "he went to the lighting" *i. e.* "began to light."  
 2. *chîl-sut* or *chîl-ao sut* "he went (began) to do."  
 3. *dam-dhed vardhêd* "he is able to breathe (strike breath)"  
 (Hind. *dam mâr sakla*).

N. B. The form *chîl-ao sut* may be compared with *ghiêw sut* "he went (to) the hunt", to show that there is nothing exceptional in the Verbal Substantive taking the Accusative (which is the same as the Nominative,) form after the verb *sut* "he went". In both cases it is probably a contraction for the Dative *chîl-ao-ird* and *ghiêw-ird*. Cf. English "he went a journey", "he wrôte me word". The Infinitive is merely a case of the Verbal Substantive. With common compounds, as in Hind. before *sakna* and *chukna*, or, in Persian after *bâyad*, *tawânad*, &c., the termination vanishes and the mere root is left.

The Numerals are :

|          |                      |             |                     |
|----------|----------------------|-------------|---------------------|
| 1. one   | <i>yîw, yî, or î</i> | 7. seven    | <i>wurd</i>         |
| 2. two   | <i>dho</i>           | 8. eight    | <i>waskht</i>       |
| 3. three | <i>arraï</i>         | 9. nine     | <i>nào</i>          |
| 4. four  | <i>tsavòr</i>        | 10. ten     | <i>dhîs</i>         |
| 5. five  | <i>pinz</i>          | 11. eleven  | <i>dhîs-et-yîw</i>  |
| 6. six   | <i>khhâuskh</i>      | 15. fifteen | <i>dhîs-et-pinz</i> |

## SHIGHNI STORY.

### WOI—DIRÊGH.

1. Rôzé<sup>1</sup> î Pâdskhâh Wazîr-katti shart i chugj.<sup>2</sup> Lovdj-é<sup>3</sup>: "Agar mu'nd' puts sôd,<sup>4</sup> tu'nd<sup>4</sup> razîn sôd<sup>5</sup> khu razîn mu puts-ir dhâd." Wazîr-en<sup>6</sup> nâstj-en' di kauli en' skhud. 2. Rôzé vòd, Wazîr-ar puts sut, et

<sup>1</sup> Persian.

<sup>2</sup> The Perfect Tense "has made" with the terminational pronoun (*i*) of the 3rd pers. sing. prefixed.

<sup>3</sup> The terminational pronoun of the 3rd pers. sing. here follows the verb.

<sup>4</sup> Genitive absolute "of mine", "of thine."

<sup>5</sup> 3rd pers. sing. Indicative (for Conditional) of the verb *sitao* "to go" or "to become." The meaning is, therefore, literally "if a son of mine should become (existent), &c."

<sup>6</sup> The Plural affix of nouns, which is the same as

<sup>7</sup> The terminational pronoun of the 3rd pers. pl.; the latter belonging to the verb *skhud* "heard" (for *skhud-en*, like *nâstj-en*). *Nâstj* is the Perfect Tense "have sat down" (*i. e.* "are" or "were sitting"); *skhud* is simple Past Tense.

Wazîr mûd. Pâdskhâh-and<sup>6</sup> razîn sut. Sabâr en<sup>6</sup> khabar Pâdskhâh-ar vûd.<sup>10</sup> "Razîn tu'nd sut." 3. Pâdskhâh marakan nustjîn<sup>11</sup> vòd,<sup>12</sup> yî âdam âz vâj déid, sukhan i chûd: "Wazîr mûd." Pâdskhâh khu khêshi<sup>13</sup> "khair"<sup>14</sup> i chûd. Mardum en' di skhud. Wazîr-bachah réid.

4. Roz ba roz<sup>15</sup> kad<sup>16</sup> chûd,<sup>15</sup> kattâ<sup>16</sup> sut. Meth-ov vòd, tar khu màd sukhan i' chûd, lovd-ó:<sup>17</sup> "Eh, màdar-i-mihrbân,<sup>1</sup> mu ped-end<sup>2</sup> i tir-i-dast<sup>1</sup> yast." Ya lovd: "Tar khazîna dedh." Yü déid tar khazîna, tir-i-dast i' zokht khu<sup>18</sup> naskhtuid. 5. Naskhtuid tar vâj, khu mashk<sup>1</sup> dar-rao<sup>1</sup> chûd-ao sut.<sup>19</sup> Ba'd<sup>14</sup> lap-ath mashk i' chûd, pahlawân sut. 6. Yî ghinik<sup>20</sup> âz bâzâr yat. Taghâr-andé pài, wum kal-tó,<sup>21</sup> et<sup>18</sup> yat. Yü tir-i-dast alâ<sup>22</sup> i chûd, wu'm taghâr-ti<sup>21</sup> wedhd-é, di âz mi palé tar wi palé zabòd. 7. Pài ar-wum pîts khhavd. Ba'd idis<sup>23</sup> khu pîts-ir dhöst i dhâd. Nazar wedhd tar bachgalâ.<sup>24</sup> Fuk-on dath tir-pur,<sup>25</sup> Wazîr-bachah 'nd khhâli. 8. Ba'd i' lovd: "Eh, bi-nafas! tu at<sup>26</sup> idis vòd, di âz màdar at mutawalid sut. Pâdskhâh khu khêshi az tu khair i' chûd." 9. Ba'd khu dhöst tar khu jèb i' yòd. Az-um-undó pul i' zwâst. Patte'wdé tar wum ghinik: "Eh ghinik! tu pul zez, sukhan-i-bad<sup>1</sup> chiz kini?"

10. Khu màd-ar di gap dhâd, lovd: "Eh màd! mu ped-end<sup>27</sup> achi chiz yast? Yem mardum né yâdin<sup>18</sup> tar mu. Yî âdam i' ramâd tar kishlâk. Fuk-ath jam' i chûd khu<sup>18</sup> vûd-è.<sup>17</sup> Tar Pâdskhâh<sup>28</sup> khêz digar yî âr-ath na sut. Ba'd mardum-ird khhurâk<sup>1</sup> dar-rao<sup>1</sup> dhòd-ao sut.<sup>29</sup> 11.

<sup>6</sup> Genitive absolute.

<sup>9</sup> Separable term. 3rd pers. pl. belonging to *vud*.

<sup>10</sup> *Fut*: Past Tense of "to bring."

<sup>11</sup> Adjective: "sitting."

<sup>12</sup> Past Tense of verb *vidao* "to be."

<sup>13</sup> A local expression: "to say 'well' to", = to refuse."

<sup>14</sup> Arabic.

<sup>15</sup> Lit. "made stature."

<sup>16</sup> Turki.

<sup>17</sup> Terminational pronoun 3rd pers. sing.

<sup>18</sup> "And."

<sup>19</sup> Lit. "went to the doing," *i. e.* "began to do"

<sup>20</sup> Diminutive of *ghin*.

<sup>21</sup> Locative. Lit. "(there was) some whey in a vessel on her head, and she came."

<sup>22</sup> "Made his bow (into) a ring," *i. e.* "pulled it till it was bent almost double."

<sup>23</sup> "After such."

<sup>24</sup> A special plural, "a troop of boys."

<sup>25</sup> Persian; meaning "arrow on string," or, as we say of guns, "loaded."

<sup>26</sup> Terminational pronoun 2nd pers. sing.

<sup>27</sup> Genitive absolute.

<sup>28</sup> 3rd pers. pl. *Present Tense*.

<sup>29</sup> Genitive.

<sup>30</sup> See (19).

Ba'd tar khbalk maslahat i chùd. Lovd: "Yi âdam tar Pâdskhah khèz bâzam. Az mard kaul, et<sup>18</sup> az zan fèl." 12. Wi âdam en ramâd, yû sut Pâdskhâh khèz-andé, salâm i chùd. Lovd: "Wu aleikum as-salâm. Êh! khânah-i-padar mubâarak bâshad.<sup>1</sup> Tu khub khub pond at<sup>20</sup> sâr chûgj. 13. Ba'd yû kîssa i zokht, lovd-é: "Pâdskhâh-i-'âlam! Mu-ir<sup>31</sup> tar tu khèz Wazîr-bachah bokht. Wi âtâ<sup>16</sup> katti dis shart at<sup>20</sup> chugjit.<sup>32</sup> Pâdskhâh-en<sup>3</sup> kal-ird ti tsa yâdh, wâdh az khu kaul na gardhen. Yem chiz sut?"

14. Ba'd Pâdskhâh lovd: "Injâvid di! Surb di<sup>29</sup> ghaiv-ti<sup>21</sup> tis-kinid. Yî gad-ird pand-yâd sôd." 15. Ba'd yû chorik naskhtud, khu sut tar Wazîr-bachah khèz. Wazîr-bachah wind-é wi, lovd: "Eh! di<sup>29</sup> surb az di<sup>4</sup> ghaiv-ti<sup>21</sup> zézid." Wi surb zokht-en. Ba'd sukhan i' wi pekht. 16. Yû lovd-é: "Wuz am<sup>35</sup> tamâ gap am<sup>35</sup> dhâd. Pâdskhâh lovd-è: 'Mi ghaiv-ti surb tis-kinid. Yî gad-ird pand-yâd sôd.'" •

17. Wazîr-bachah gaskht tar khu wazîr-en, sukhan i chùd, lovd: "Mâsh tsi-rang kinam shich," lovd-é: "Maslahat kinid." "Yî ga âdam bâzam." Yî ga âdam en bokht. 18. Firebt Pâdskhâh-en<sup>36</sup> khèz-andé. Ba'd az salâm, gap i zokht. Pâdskhâh lovd-é: "Injâvid di!" Wazîr en<sup>37</sup> lovd: "Eh! Pâdskhâh-i-'âlam, tu awwal gap dhâd, âkhir yû zülîkîk gadhâ dô<sup>38</sup> idund tambi wedhd; tamâ katta dô<sup>39</sup> tambi wedhid. Shich dô<sup>40</sup> idis ved: Bâz-i-sufèd mu'r vâ, wuz tu-katti khèshi kinam." Wi chorik en rukhsat dhâd. 19. Sut Wazîr-bachah khèz-andé, lovd-é: "Shèr at<sup>1</sup> ya robâ?" Lovd: "Néi, wuz am mudâm-ath shèr-bachah vòd." Lovd-é: "Wâkî'a-i-kâr<sup>1</sup> ikyam: bâz-i-sufèd mu'r vird."

20. Ba'd yû gaskht tar khu wazîren, lovd: "Anjâm kinid." Ba'd en anjâm chùd. Wi'r tuskha' anjâm en chùd. Sahâr tar pond en dhâd.

<sup>18</sup> Accusative.

<sup>21</sup> Pluperfect.

<sup>29</sup> Adjectival Pronoun, Accusative.

<sup>31</sup> Substantival Pronoun, Genitive.

<sup>32</sup> Terminational pronouns 1st pers. (one of them probably superfluous).

<sup>35</sup> Probably the Plural of respect.

<sup>37</sup> For "Wazîren lovd-en." The plural affix of the noun and of the verb being the same, is not repeated; one serves for both.

<sup>38</sup> A particle which seems to serve many purposes. Here it would seem to answer to *kîh* in Persian, *viz.*, "that", conj., used for relative pronoun.

<sup>39</sup> Here it was explained as forming a comparative. In the Gaddi (Hind.) dialect there is a similar word, e. g. *baṛā dēa gal* "a big-like matter."

<sup>40</sup> ? di (this).

<sup>41</sup> The separable term or pronoun of the 2nd pers. sing. used without the verb substantive (see Remark 3, p. 168 of my Paper on the Ghalchah Languages, *As. Soc. Journal*, Pt. I, for 1876.)

Fuk-ath en rawân wi-katti sut, yû wîzîvd-i wief, lovd : "Mu'rd et<sup>43</sup> ba-kâr nist.<sup>1</sup> Wuz yî kalendar. Agar Pâdskhâh khizmat am vâr-dhâd,<sup>43</sup> ikhyd. Tamâ wîzâftsid." 21. Ba'd khu-bath rûi ba râh i chûd, râh ba biabân, ba'd bar dâman-i-dasht. Chandîn farsang i dhâd. i skhats mâbain-ir yat. 22. Ba'd az khu vorj-ti<sup>21</sup> khhavd. I sowâr az wi ruya yat, skhhats zimbati khhavd. Tar yak digar en sukhan chûd. Lovd : "Eh vrôd ! mubâarak safar. 'Tu tar kâ 't<sup>26</sup> ikhtiyâr chugj ?" Yû lovd-é : "Wuz am<sup>44</sup> khizmat-i-Pâdskhâh rawân, bâz-i-sufêd-ird rawân-am<sup>44</sup>." 23. Yû lovd-é : "Tu ism-sharîf chiz ?" Lovd : "Wazîr-bachah." Yem vào wi pekhst-é ; yû lovd : "Alâ-âspa." Ba'd lovd : "Yet, katti sâo-am." Yû lovd : "Tu khu tsem bidhêm, khu pîts tar zabô kin, wuz yet-am." Yû khu tsem i<sup>47</sup> bidhêm, khu pîts tar zabô i chûd. Pâlê gaskht, yû wi khêz-andé.<sup>45</sup>

24. Ba'd en katti sat, khu tòid-en. Sat i daskht-andé. Chandîn râh en dhâd, tâskhna en sut, guskhna en sut. Ba'd en wum daskht môdhen-andé khhavd. Lovd : "Eh vrôd ! yî lav tuskha ziwdh." Tuskha i zwâst, dar-rao khêd-ao en chûd. 25. Ba'd tuskha en khûd, lovd : "Tu tari tamâsha sâo, yî zir-i-zir bon varéyé, mâsh skhab-panâh kinam." Ba'd Wazîr-bachah nûst, et Alâ-âspa sut. Tar wi daskht khêl-ak charkh i chûd. Hêch chiz-ath maujûd na sut. Ba'd ikyum-andé nafas i nûst. Dastba-duhâ<sup>1</sup> i chûd, khu kal khambind-i ; khu kal i sind, chûskht-ô : Kîla tayâr sudhj, darwâza hêt-ath. Rawân sut, tar kila déid, tamâsha i chûd, khu wîzîvd az khu jâi-té,<sup>21</sup> sut tar khu hamrâh khêz. 27. Lovd-é : "Eh vrôd ! i zir-bon am vûd, nur-skhab sâo-am, yum-andé skhab-panâh." Ba'd en sut, déid-en tar kîlâ. Lovd : "Eh vrôd ! yû zir-bon kaiyi ?" Lovd : "Zir-bon-i kam vòd ?" 28. Sat-en, zîz en vûd. Yiw dar-rao yâts pedhed-ir sut.<sup>46</sup> Yiw pis-skhats sut. Ba'd âb ta'am en sat. Khhûd-en, khu vorjen darakht-khhâna en vûst. Chustj et wokht en lâchûd.

29. Skhab en yum-andé skhovd, sahâr Alâ-âspa lovd-é : "Wuz ghiéw sâo-am, tu neth." Yû tûid ghiéw, yem nûst. 30. Wazîr-bachah khhurâk i pukhta khu'r chûd. Khu-bath khhud et wi baskh bighîn i chûd, khu lâchud-i. Khu-bath yat, khu bistar-tô khu pattêwd-i. Zamân vòd, divé sadâ chûd. 31. Yî chiz-i-yak-wajabi déid khu naghjid tar kitsâr. Yî târ<sup>1</sup> burût<sup>6</sup> i khu'nd pikod, wi dhöst et pâdh i vûst, pattêwd-i. Khu-bath wi

<sup>43</sup> Terminational pronoun of the 2nd pers. pl.

<sup>43</sup> For "vâr-dhâd-am," Past Tense of compound verb.

<sup>44</sup> Here the terminational pronoun (1st pers.) may also be said to replace the verbal substantive, as *rawân* is a (verbal) adjective, and not a part of the finite verb.

<sup>46</sup> Here is a case of the suppression of the verb substantive after the ordinary pronoun *yû*, similar to its suppression after the terminational pronoun *at* above (note 41).

<sup>46</sup> Lit. "went to the lighting." This Dative form seems equivalent to the other *chêd-ao sut*. We may perhaps take the former to be the full form and the latter to be

khhuràk i kkhud khu naskhtuid. Wazîr-bachah zur i chùd, ba azâb i yet-chùd, khu pis zabô i wi chùd.

32. Daryâv i wi chùd, yû zabôd tar ghor. Yem khhafâ sut, khu wiz, ivd. Déid tar kilâ. Khu-bath yet, khu jâi-ti nûst. Khu midhj i zokht dar-râo pisen dhêt sut. Divé sadâ chud. Yû khu midhj i zokht khu zabôd tar divé zabô. Az-um Alâ-âspa déid. 33. Lovd: "Eh vrôd! mu badi tar haḡ-i-tu chiz?" Wi lovð: "Tî-am, gap tu'r dhâd-am." Ba'd sut. Alâ-âspa khu wiz i az khu dâm-té lâchud. Yid sut, ta'am i wi'r vùd. Ta'am i kkhud et fâtiha i lovð. Wazîr-bachah andûid, dèg et tabâk darrâo zanéd-ao sut.

34. Ba'd Alâ-âspa lovð: "Mu badi tar haḡ-i-tu chiz vòd?" Yû lovð-é: "Eh! tu badi tar haḡ-i-mu nist, wuz et tu am vrôd. Wuz am yî wakhht khhuràk pukhta chùd, khu-bath am kkhud et tu'rd am lâchud. Khubath am yat khu jâi-ti am khu pattéwd. Divé sadâ chùd. Yak-wajabi déid. Ba'd î târ' burât i khu'nd nakhvend. Mu dhöst pâdh i vûst. Khu-bath zabôd wi âb ta'am i kkhud. Ba'd khu-bath naskhtuid. Wuz am zur et zur ba azâb am khalâs khu chùd, ba'd pis-zabô am wi chùd. 35. Daryâv am wi chùd, zabôd tar ghor. Wuz am wizivd. Yett-am, khu midhj am zokht, ikyund an nust. Divé sadâ chùd, Wuz am zabôd, di<sup>36</sup> mi pith tsa dedhd, mu mis farô yest. Tu at déid." Khu birej en wedhd khu skhovd-en.

36. Sâhar rukh dhâd, Alâ-âspa lovð-é: "Eh, Wazîr-bachah! tu sâo ghiéw, et wuz netham." Wazîr-bachah tuid ghiéw, yem dar-râo âb ta'am sut. Khuràk-i pekht, khu-bath i kkhùd, wi'rd i lâchud. Khu midhj i zokht, khu yat ikyum-andô nûst. 37. Ikyuwi wakhht vod, divé sadâ chud, et yam mis anduid et yû mis déid. Midhj hawâlâ chùd, wi kal dbâd tar pâi-gâh, wi tanâ tar divé zabô. 38. Yem zekht-é, khu tothch virik i jam' chud, wiklin mà-sòd. Tâ mi khhavd-ao-ird<sup>47</sup> wi kal zabôd wi gardhân-té, jaosar sut. Ba'd naskhtuid khu ratsust. 39. Alâ-âspa pis-zabô i wi chùd. Daryâv i wi chùd. Yâk bâr pâlô gaskht et dhöst tar bon i chùd, lovð-é: "Sâhar, khu hâl chiz, winid."

40. Alâ-âspa wizivd ghamghîn, déid tar kilâ. Yat, khu jâi-té nûst. Khu midhj khu-tar-dâmân lâchud. Ghâyat i vòd, divé sadâ chùd, yem

dative or locative in meaning notwithstanding the absence of the proper affix, as in the examples *âb ta'am sat*, *ghiéw suoam* "went (to) drink and food," "I go (to) the hunt." Cf. the English "give *me* the book," "write *me* word." At any rate the form answering to our infinitive ("began to do &c.") seems to be some case of the verbal substantive.

<sup>47</sup> *Tâ yam khhavd-ao* was first given as a form with the same meaning. But on reflection my informant corrected himself and gave the form in the text. It shows how purely the so-called Infinitive (in *ao*) is in Shighni a verbal substantive. It governs the genitive of the pronoun (the subject) and takes the affix of the dative case. Literally: "till his sitting down."

anduid. Wazîr-bachah déid. Lovd : " Mu badi tar haq-i-tu chiz ?" 41. Lovd : " Hèch chiz-ath nài ; biyâr at tu lovd, wuz am bâwar na chûd. Tu gap râst vudhj. Yat, mâsh shich khu ghiéw chîd-ao là-kinam. Chiz mâkri hîlâ kinam ki wi ghor dedham. Tanâb-i-abréskhamîn tébam." 42. Chil gaz tanâb en tebt. Sâhar âb nahôr en chûd, rawân en sut tar pond. Wazîr-bachah lovd-é : " Wuz dédham." Alâ-âspa lovd : " Khub, tu tâkat na vardhê." Ba'd firébt-en yum-andé. Kamand wi baghal-andé sakht i chûd. Wedhdé, tâ zân-its sut, lovd-é : " Pach ! sukhtam." 43. Alâ-âspa kamand tîz-dé, lovd : " Eh Wazîr-bachah ! naubat mu'nd. Yi nasîhat tu'r'd kinam. Waz lów-am : ' Pach ! sukht-am' tu sust-dé <sup>48</sup> là-kin." Alâ-âspa wedhd-é. Lovd-é : " Pach ! sukht-am !" Yü sust-dé là-chûd. Al-ķissa khêl-i-wakhht naghjîd, tanâb wi mi dhôst kôt reid. Yü tar bir-jahân, tar Childiniâ, firébt. Tanâb az khu baghal-ti khalâs chûd. Ba'd yem Wazîr-bachah wi ghor ghaiv-ti gulkhan wedhd-é.

44. Alâ-âspa rawân sut, mâl az parao dichâr wi'r yet. Az chupân duhâ i chûd, lovd : " Eh ! yem mâl chi 'nd ?" Chupân lovd-é : " Yak-wajabi 'nd." Yü firébt yi yirk i injuvd, ruh-i-hawâ wi kal i zokht. Yi sekhh kabâb az wi-ti khu'r'd i chûd. Kabâb i pekht, kkhud-é, dedh tûid. 45. Ba'd stôr-dâr az parao yet. Duhâ i chûd, lovd-é : " Yem stor chi 'nd ?" Yü lovd-é : " Yak-wajabi 'nd." Yü sut, ki az wi katta-dé skhij nài, ikwi injuvd ; <sup>46</sup> wi kal i zokht. Yi sekhh kabâb az wi-ti khu'r'd i chûd. Wi digar i pattéwd. Chupân dhâd yi skhkufsta khu pis-pîts. 46. Yü rawân sut, ghâyat jâi sut, skhtur-bân dichâr wi'r dhâd. Duhâ i chûd, lovd-é : " Yem skhtur chi'nd." Yü lovd-é : " Yak-wajabi 'nd." Yü sut, ki az wi katta-dé bughra <sup>46</sup> nài, ikwam injuvd. Wum kal i zokht. Yi sekhh kabâb az wi-ti khu'r'd i chûd, khu rawân sut. Sarwân' dé khu pis-pîts. 47. Yü tûid. Galla-bân wi'r dichâr yet. Duhâ i chûd, lovd-é : " Yem galla chi'nd ?" Sut, i katta vorj injuvd, wi kal i zokht. Yi sekhh kabâb az wi-ti khu'r'd i chûd. Yü galla-bân dé khu pis-pîts. 48. Yü tûid ; tar ~~skhâr~~ firébt. Khazinachi darvâza-andé nûstj. <sup>49</sup> Yü lovd-é : " Tu yundé chi'r <sup>50</sup> kini ?" Yundé parindah dam-dhed na vardhêd. Lovd-é : " Har chiz ved, ba nasîb-i-khu am yet." 49. Alâ-âspa wi pekhté " Yak-wajabi jân chiz darun ?" Lovd-é : " Nur dho rôz' sut, yü pa tîr-dinyâ vod, az-um zakhmi yet. Shich skhovdj. <sup>49</sup> Wi jân wi pis-pâlê, dho zir, yiw az mi pâlê, yiw az wi pâlê. Wief zîren varagh. Az wi darun dho kshêbts naskhtîst. Wief kalen tar chap skhehand. Wi pis pâlê yi mâth, wi dhâ tar zân, varagh. Wi darun

<sup>48</sup> Lit. " that than it (there was) no larger bull, that same (one) he seized." The Shighni mode of expressing the superlative.

<sup>49</sup> Both these verbs being verbs of action not of condition or state (*viz.* to sit down s'assoir "to go to sleep", s'endormir, and not "to be sitting", "to sleep"), our Present Tense in their case is represented in Shighni by the Perfect, *viz.* "he has sat down" = "he is or was sitting"; "he has gone to sleep", "he is asleep or sleeping."

yi tsirao naskhtist. Wi dhâ tar skhats, wi jân naskhtist. Agar pinj-dâna wi tsa kini, wi na mird. Yiw ki az def yiw at khatâ dé<sup>50</sup> na chûd<sup>50a</sup> yû ta mird." Yü def kaulen i ba jâi chûd. Yü mùd.

50. Chil wi skhidz mèkhh-ir vòd. Wi zokht, divé-en dar-rào het chîd sut. Fuk-ath i het chûd, yiw réid. Yet, wi mis het i chûd et déid tar-am. Yi khub-rûi tar-am. Na khher tar wam dàkhlh, na nèst. 51. Ya dar-rào niwd-ao sut, lovd: "Eh jawân! tu chiz-ar khu zâya kini?" Yü lovd: "Sadaqa yak târ mùi tu. Tu taròd chi'r kini?" Lovd-é: "Wuz am wuvl-sûlà vòd, yak-wajabi mu tsift, khu vud-i taròd mulkam i chûd." Yü lovd-é: "Mubàrak ved, wuz am wi zîd." Ya lovd-é: "Wi zîd-ao asân nist; pinj-dànù dàdhgâd wi tsa kini, yû na mird." Alâ-âspa lovd-é: "Té-am, ches, wuz am wi zîd." Dhöst-andé injuvd khu yeten. Chûskht-é, muglj.

52. Ba'd skhab en nâst, khurâk en khhud. Bar skhevd-ao en yet. Khu midhj i tîzd, medhóna-'rd i pattéwd. Ya lovd-é: "Dis chiz-ir kini?" Yü lovd-é "Wuz am nasihat-i-padar zokhtj. Har wakhlt tar khu watan na firébtj-am, khu kaman het na kinam." Ba'd en skhuvd. 53. Sahar ikwid-und dinyâ wiz i chûd. Fuk-ath wiz i chûd. Yet-en wi ghor ghaiv-andé. Kamand i junbind et yiwi yiwi pi-kamand vûst et yû tîzd. Al-kissa tîzd-é tayâr sut, et ikyiwan khub-rûi vùd. Wazîr-bachah tîzd-é. Tâ ba yak dîdan' wuam pîts i wind, ba sad dîdan 'âshik. 54. Alâ-âspa yi tér jândâr ar-khu-khêz i là-chugjit. Az barni azmâish' kamand i chûd tar wi; lovd-é: "Bashând tâz, dé wuz-am." Wazîr-bachah tîzd-é, yi chuvgaz jâi réid, et yû chûskht-é tér jândâr. Dedhé kamand i skhechukht. Yü dhâd ar wi khêz, tît tît sut. 55. Ba'd lapath i niùwd, lovd: "Eh diregh dinyâ. Dar rûh-i wum khub-rui, nu i mi jinâutj."

56. Ba'd Wazîr-bachah fikr i chûd, lovd: "Waz am na zwâst av (?)<sup>51</sup> wi. Wizîvd, yet tar ghor kal, tanûb i pattéwd aram. Tanûb injuvd, yû tîzd. Alâ-âspa naskhtud. Dhâd ba yak digar baghal, lap en niùwd. 57. Alâ-âspa lovd-é: "Vròd, tu et dis chiz-ir chûd. Khub-rû at 'âshik sut, mâl-i-dinyâ tu at 'âshik sut." Lovd: "Har chiz vòd yi disâj sut." Sut-en tar kîlâ. Wazîr-bachah lovd: "Yet, baskh kinam." "Alâ-âspa lovd: "Tu baskh kin." Wazîr-bachah dar-rao baskhtjit<sup>52</sup> sut, khu katta et bashând khu'r zezd, rèz-gi dhîd wi'rd. Alâ-âspa lovd-é: "Yid mazlum<sup>52a</sup> mis tu, yid mâl mis tu, mu'rd hâjat nist." Ikyuwi khu baskh dà chûd wi'rd. 59. Lovd-é: "Tu neth, wuz saò-am bâz-i-sufèd wuz tu'r vâram. Yîd nûst, Alâ-âspa tûid. Chandîn muddut-i-wakhlt naghjid. Sut az yi skhâr-andé, bâz-i-sufèd zokht et yet.<sup>53</sup> Yet yun-andó skhâb i

<sup>50</sup> Accusativo.

<sup>50a</sup> Past tense for conditional: "if thou hast not failed" for "if thou fail not", &c.

<sup>51</sup> Perhaps to be compared with Sariçoli accusativo, "*a-wi*."

<sup>52</sup> A curious form. Lit. "had divided, went."

<sup>52a</sup> Lit. "oppressed one," i. e. "woman." A Turki idiom.

nâst<sup>55</sup> sâhar, i lõvd : “Rawân sào-am.” Khurâk en khûd et khu vorjen bidhân en chûd ; rawân en sut.

60. Chandin muddat-i-põnd en tòið.<sup>56</sup> Ba'd tar wi skhats zimb en firebt. Ba'd Alà-âspa lovd : “Ikyundé khush kinam.” Wazîr-bachah lovd-é “Yet, mi mâl baskh kinam.” Alà-âspa lovd : “Nài ! Az tu shîr-i-mâdar<sup>57</sup> tu'r piyil. Et mu'nd yî shart tu katti yast. Ikyuwi at mu'r chûd,<sup>58a</sup> dinyâ et kyâmat wuz az tu râzi. Shart mu'r lõv. Mi shart ik-yam. Sut-at khu sur at chûd<sup>58a</sup>, ba takht bakht at firebt, skhevd-áo-tó at di<sup>58</sup> sut,<sup>58</sup> khu pâdh tar khu ghin kiné, lõv : “ ‘Mu moza tâz.’ Ba'd yi pâdh é di<sup>58</sup> tiẓl, lõv : ‘Wòi dirègh !’ Dé idund at di<sup>58</sup> chûd,<sup>58a</sup> wuz lap-ath râzi az tu.”

62. Alà-âspa tùið tar wi ruya. Wazîr-bachah yet tar khu jài. Pâdskhâh'r khabar en yòd, ki Wazîr-bachah yat, bâz-i-sufèd i vùd. Pâdskhâh wi âdam-ir mughda-khwâhi dhâd. 63. Wazîr-bachah firebt, déid tar Pâdskhâh khèz. Bâz i zokht et déid. Pâdskhâh az khu jài-té andùid. Kullugh,<sup>59</sup> i chûd. Bâz i zokht khu dhöst-té, lovd-é : “Wazîr-bachah, tu lap-ath mât at sudhj. Sào tar chîd.”

64. Yü sut tar khu chîd. Wi mâd wi winḡ ; khush-wakhht sut. Skhab nûst et sâhar i khu sur injuvd. Mardum en jaun' sut. Pinz meth sur en dhâd. Pâdskhâh dund sur i na dhâl, di Wazîr-bachah dund sur tsa dhâd. 65. Véga'r nikâh en chûd. Khu ghin i zokht khu tùið tar khu chîd. Shevd-áo-tó khu pâdh tar khu ghin i chûd. Lovd-é : “Mu moza tâz.” Ba'd yi pâdh i tiẓl. Lovd-é : “Wòi dirègh !” et wi ghin lovd : “Yem chiz sut. Woi-Dirègh at diodhj,<sup>59</sup> mu chiz-ir at yòd ?” 66. Yü lovd : “Woi-Dirègh mard, kakhoi na vòd.” Ya lovd : “Nài, kakhoi. Ikwi meth tu at tsa tùið, ya mis tùið. Wuz et ya katté maktab-bandî am skhéid.” Lovd : “Dis di tsa ved, tu at mu'rd hêch-ath hâjat nist.” 67. Khu moza i pinùid, khu vorj sowâr sut, khu ikwi skhab-ath tùið. Al-kissa rukhh sut. Yi ràrà az parào yat. Duhà i chûd, lovd-é : “Yem mâl chi'nd ?” Lovd-é : “Woi-Diregh-ind.” 68. Taram dé<sup>59</sup> sut ; sarbân wi parào dichâr yat. Lovd : “Eh sârwan ! yem skhtur chi'nd ?” Wi lovd : “Wòi-Diregh.” Taram dé sut, pâda-bân wi'rd dichâr yet. Lovd : “Yem pâda chi'nd ?” Lovd-é : “Wòi-Diregh-ind.”

69. Sut, yi bâgh az parào yat. Lovd : “Yem bâgh chi'nd ?” Bâgh-bân lovd-é : “Wòi-Dirègh.” Bâghbân yi lagan-andé gul i zokhtj. Bâgh-bân pîts tar wi pâlè vòd. Yid khu naghina zokht, gul medhen-andé rubùid-é.

<sup>55</sup> These words seem to have two different forms : “*yet*” and “*yat*”, “*nâst*” and “*nûst*”, “*tùid*” and “*tòið*.”

<sup>56</sup> Lit. “thou hast gone to the sleeping.”

<sup>57</sup> Lit. “Service” (Turki), a common salutation among friends.

<sup>58</sup> Lit. “hast caused to enter (*viz.* thy house).”

<sup>59</sup> Diminutive of *kantz*. P.

Bâghbân zokht khu tùid. 70. Firêbt-i Wòi-Dirêgh-ird gul. Ya takhht-té khu pattéwdjît. Yem gul wam-ird injuud. Ya lovd : "Eh bâghbân ! tu 'ajab khush-bûi gul at vùd. 71. Ba'd gul i zokht, het i chùd. Naghi na naskhtuid. Lovd : "Eh bâghbân ! ar-bâgh chàì ?" Yü lovd-é : "Eh bébé ! yi shakhs ar-bâgh déid." Lovd : "Gul ba rùi wi na lòvé."

72. Wazir-bachah az-bâgh naskhtuid. Yet tar kıla divé. Kanizak<sup>45</sup> pis-skhat's naskhtoid. Yem yet, butta<sup>46</sup> zimb-ti nûst. Kanizak yet, skhat's i zokht. 73. Lovd : "Eh kaniz ! skhat's mu'r dhâd." Lovd :

Tu 'ajab bé-darak âdam at tu nist ? Wòi-Dirêgh pari-zâd. Tu tsi-rang wam jâm-andé skhat's brézé ?" Na dhâd wi'rd skhat's ; Skhat's i zokht khu rawân sut.

74. Yi gaz jâi na sat et ya skhat's wikhin gaskht. Ya wi tis i chùd, vôi yat skhat's i zokht. Lovd : "Eh kanizak, skhat's mu'r dhâd." Kanizak na dhâd. 75. Vôi tar wi khu jâi sut, et wikhin gaskht. Vôi tis wi chùd, Vôi yat, skhat's i zokht. Lovd : "Eh kanizak ! skhat's mu'r dhâd." Ya na dhâd-ó.

76. Lovd : "Eh kanizak ! tu véga'r tsa yossé tar wam khèz skhat's na firebé. Skhat's mu'r dhâd." Jâm i lap chùd, injuud-é wi'rd. Yi lav i brokht, khu naghina pattéwd-ó ar-jâm. Khu lumâl skhat's-té biglîn i chùd, lovd : "Wi kal het na kini, farib Wòi-Dirêgh-ir."

77. Vùd-ó, lovd : "Eh ! tu tsi-rang skhat's vârê ? Yem khîr véga sut." Lovd-é : "Mu'nd tu khéz 'arz ; ba'd har-rang at dé mu'r chu." Ba'd khu kıssa i zokht. "Dund shieh har-rang dé mu'r tsa kinid, kelân id." 78. Lovd-é : "Sâ ! kıwé." Ya naskhtuid, kıwd-i wi. Ba'd déid, As-salâm i chùd. Ya az khu takhht-té andüid wi'rd. Dedhó sifend, khu pis-pùlé wedhd. 79. Ba'd az chandîn muddat-i-wakhht, kanizak-ird i lovd : "Sâ, mullâh kıw kin." Sat mullâh i kıw chùd. Mullâh wief i chùd nikah ba yak digar. Wâdh en ba takhht et bakhht firêbt. Mâsh mis tamâ dâulat-andé firâb-am.

## TRANSLATION OF SHIGHNI STORY.

### WOI-DIRE'GH.

1. One day a king made an agreement with (his wazîr), (and) said : If to me there be a son (born), and to thee a daughter, (thou shalt) give thy daughter to my son. The (other) wazîrs were sitting (there), and heard this compact. 2. One day a son was (born) to the wazîr, and he died. To the king a daughter was (born). (Next) morning they brought the news to the king : "A daughter has been (born) to thee." 3. The king *was* sitting in public, (when) a man came in, (and) said : "The wazîr is dead." (But) the king refused his alliance. Men heard this. (So) the wazîr's son remained (unmarried).

4. Day by day he increased in stature and became big. A day was, (that) he spoke to his mother (and) said: "Gracious mother, there is a bow of my father's." She said: "Go into the treasury." He entered into the treasury, and took the bow and came out. 5. He came outside, and at once began to exercise himself. He practised much, and became expert. 6. A woman came from market. She came with (some) whey in a vessel on her head. He pulled the bow, (his arrow) struck this vessel, so that it passed through it from one side to the other. 7. The whey poured down into her face. Then she put her hand to her face. She fixed her eyes on the boys. All of them (had their) arrows in their bows, the wazir's son's (was) empty. 8. Then she said: "Oh wretch! was it for this that thou wast born of thy mother? The king has (done well to) refuse relationship with thee!" 9. Then he carried his hand to his pocket, and took a penny thence. He threw (it) to that woman (saying): "Oh woman! take thou the penny; why dost thou speak evil words?"

10. He told his mother (of) this matter, (and) said: "Oh mother! what evil (?) was there in my father. These men come not into my presence." He sent a man into the villages. He assembled all the people, and brought them (in). Not any one went into the king's presence. Then he began at once to give food to the men. 11. Afterwards he took counsel with the people. He said, "I will send a man into the king's presence, (and say) a man's *word* (is equivalent to) a woman's *deed*." 12. They sent the man, (who) went into the king's presence, and saluted (him). (The king replied:) "And to you be the peace. May thy father's house be blessed. Thou hast accomplished a good journey." 13. Then (the man) took up his tale, (and) said: "King of the world! The wazir's son sent me before thee. Thou hadst made such and such an agreement with his father. Whatever falls upon the heads of kings, they turn not away from their word. What is this (that thou doest)?"

14. Then the king said: "Seize this (man). Thrust an arrow through his mouth. (It) will be a warning to another." 15. Then this man went out, and went before the wazir's son, who saw him, and said: "Oh take this arrow from this (man's) mouth." They took the arrow. Then he asked him (of) the matter, and said: "What did he do?" 16. He replied: "I spoke thy word. The king said: Thrust an arrow through this man's mouth. It will be a warning to another." 17. The wazir's son turned to his counsellors, and spoke, saying: "What shall we do now? Consult together", he said. (They replied) "We will send another man." They sent another man. 18. He arrived in the king's presence. After salutation, he took up his tale. The king said: "Seize him!" The wazirs said: "Oh king of the world! first do thou talk (with him); after all, that is a young boy who makes so much of a

fuss; do you make a greater fuss. Now let it be thus, (say) 'Bring me a white falcon, (and) I will ally myself with thee.' (So) they gave that man his leave. 19. He went into the presence of the wazir's son, (and) said: " (Art) thou a lion or a fox?" (The other) replied: "No, I have ever been a lion's offspring." The man said: "The fact of the matter is this: let him bring me a white falcon (says the king)."

20. Then he turned to his counsellors, (and) said: "Make preparations." They made preparations. They got ready provisions for him. In the morning they set out on the road. All of them started with him, (but) he turned them back, saying: "I have no need of you. I am a *Kalendar* (beggar): If I (can) bring and give the king's service, this (is my desire). Turn ye back." 21. Then by himself he set his face to the road. His road (went) towards the wilderness, and to the skirt of the desert. He travelled many a *farsang* (parasang) (and then) a river came across (his path). 22. He alighted from off his horse. A horseman came from another direction, (and) alighted on the bank of the river. They spoke to one another. (The new-comer) said: "Eh, brother! may your journey be happy. What object hast thou chosen (for it)?" The wazir's son replied: "I am going on the service of the king, for a white falcon." 23. (The other) said: "What is your distinguished name?" He replied: "The wazir's son." This one in return asked the other (his name), who answered: "Alà-àspa." Then (the wazir's son) said "Come, let us go together." (Alà-àspa) said: "Do thou shut thine eyes, (and) turn thy face backwards, (and) I will come." The wazir's son shut his eyes, (and) turned his face backwards. He turned round, the other (was) before him.

24. Then they joined together and went on. They went into a desert. A long way they journeyed, and became thirsty and hungry. Then they alighted in the midst of that desert. (Alà-àspa) said: "Oh brother! bring out a morsel of food." He took out some food, and at once they began to eat. 25. After eating the food, (the wazir's son) said: "Do thou go for a walk on one side, thou wilt find a (place) under some rock or other, (where) we will make our shelter for the night." Then the wazir's son sat down, and Alà-àspa went off. He made a large circuit in that desert, nothing was there. Then he sat down for a moment there. 26. He raised his hands in supplication, (and) bowed his head. (Again) he raised his head, and looked: a castle has sprung up, with the gate open. He went and entered the castle, and walked through it. Then he turned away from the place, and went back to his companion. 27. He said: "Oh brother! I have found a (place at the) foot of a rock, to-night let us go, there is our shelter for the night." Then they went and entered the castle. The (wazir's son) said: "Oh brother! where is that rock shelter?" Alà-àspa answered: "Is this an insufficient rock shelter?" 28. They went

and fetched fuel. One (of them) at once began to light a fire. The other went for water. Then they began to drink and eat. They ate, and tied up their horses in the stable. They placed barley and grass (before them).

29. That night they slept there; in the morning *Alà-àspa* said: "I go a hunting, do thou sit (still)." He went a hunting, the wazir's son sat still. 30. He cooked some food for himself. He ate by himself, and covered up the other's portion and put it by. By himself he came and threw himself on to his bed. (A certain) time elapsed, (and then) the door made a sound. 31. A span-high thing came in and passed on to the fire-place. It pulled out a hair of its own moustache, bound him hand and foot and threw him down. It ate his food itself and went out. The wazir's son struggled, and with difficulty succeeded in drawing himself out of (his bonds), and pursued it.

32. He looked for it; it jumped into a pit. He became vexed and turned back. He entered the castle. He came by himself and sat down in his own place. He took his sword and at once began to sharpen it. The door creaked, he took his sword up and rushed behind the door. *Alà-àspa* entered by it. 33. He said: "Brother, what<sup>is</sup> my offence against thee?" The other replied: "Let us go, I will tell thee a tale." Then they went (in). *Alà-àspa* put down his load (of game) from off his back. The other went and brought food for him. He ate his meal and said grace. The wazir's son got up and at once began cleaning the saucepan and the dish. 34. Then *Alà-àspa* said: "What was my offence against thee?" The other said: "Oh, thou (hast) not (committed) any offence against me. I and thou are brothers. Just now I cooked some food. I ate it by myself and set (some) aside for thee. I came and threw myself down in my own place. The door creaked. A span-high (creature) entered. Then it pulled out a hair of moustache of its own. It bound me hand and foot. It ran and ate its meal. Then it went out. I struggled and struggled and painfully released myself. Then I followed after it. 35. I looked for it, and it jumped into a pit I turned back again. I came and took my sword, and sat down here. The door creaked. I started up (thinking) this time if it enters, it will at once have me down. Thou didst enter." They spread out their bedding and went to sleep.

36. The morning dawned, and *Alà-àspa* said: "Oh wazir's son, do thou go a hunting and I will sit (still)." The wazir's son went a-hunting. *Alà-àspa* at once began (to prepare) a meal. He cooked the food, himself he ate (his portion) and set aside (some) for the other. He took his sword and came and sat down there. 37. At that very moment the door creaked; he at once arose and it entered. He made a stroke with his sword, and struck its head off at his feet, (while) the body (fell) behind the door. 38. He ran and collected his cups and platters, that they

should not become bloodied. Before he could sit down (again), (the creature's) head flew on to its neck and became joined on. Then it went out and fled away. 39. *Alà-àspa* pursued it. He looked for it. For once he turned aside, and put his hand on his beard saying: "To-morrow you shall see what will happen to you."

40. *Alà-àspa* returned discontentedly, and entered the castle. He came and sat in his own place. He placed his sword on the skirt (of his robe). At last the door creaked, and he jumped up. The wazir's son came in. He said: "What offence have I (committed) against thee?" 41. *Alà-àspa* replied: "Nothing at all. Yesterday thou didst tell (me a tale); I did not believe (it). Thy story has been verified. Come, now let us put away our hunting. Let us employ some artifice to enter (the creature's) pit. Let us twist a silken rope." 42. (So) they twisted a rope forty yards (long). In the morning they made their breakfast, and went on their way. The wazir's son said "I will go in." *Alà-àspa* said: "Well, thou canst not (find) strength." Then they arrived at the spot. He fastened the rope tightly under his arms. He entered as far as his knees. (Then) he exclaimed: "Oh! I burn!" 43. *Alà-àspa* pulled in the rope, and said: "(Now) the turn is mine. One instruction I give thee. (If) I say, Oh, I burn; (then) do thou let the rope go freer." *Alà-àspa* entered. He cried: "Oh! I burn." The other let (the rope) out. 43. Finally a long time passed, the rope remained short in his hand. *Alà-àspa* reached the bottom of the earth, (the country of) *Chil-dinyà*. He undid the rope from under his arms. Then the wazir's son made a camp-fire at the mouth of the pit.

44. *Alà-àspa* started off. A flock came (along the road) from in front, meeting him. He saluted the shepherd and said; "Whose is this flock?" The shepherd answered: "The span-high one's." *Alà-àspa* came up and seized a sheep. He took off its head in the air (without throwing it on the ground). He prepared for himself one spit (-full of meat) for roasting, from off it. - He cooked and eat it, and then went on. 45. Next a cow-herd met him. He saluted him and asked: "Whose are these cattle?" (The cow-herd) replied: "The span-high one's." He went, and seized the largest of all the bulls; he took its head off. He prepared for himself one spit (-full of meat) for roasting, from off it. The rest of it he threw away. The cow-herd struck himself a slap on the face. 46. *Alà-àspa* went on, some distance, when a camel-herd met him. He saluted him and said: "Whose are these camels?" The other replied: "The span-high one's." He went and seized the biggest of all the male camels. He took its head off; and prepared for himself one spit (-full of meat) for roasting, from off it, and went on (again). The camel-herd struck himself on the face. 47. *Alà-àspa* went on. A man in charge of a troop of

horses met him. He saluted and said: "Whose is this troop of horses?" He went (and) seized a big horse, and took its head off. He prepared for himself a spit (-full of meat) for roasting, from off it. That keeper of the horses struck himself on his face. 48. *Alà-àspa* went on and arrived at the town. The Treasurer was sitting in the gateway. (*Alà-àspa*) said: "What doest thou here? Here not a bird (even) is able to breathe."\* (The other) answered: "However that may be, my fate has brought me here."† 49. *Alà-àspa* asked him: "In what (lies) the life of the span-high one?" The treasurer answered: "To-day is two days since he was in the Upper World. He returned wounded thence. Now he sleeps. His life is at his side, (and lies) in two stones, one on this side and one on that. Break those stones. From inside them two magpies will come out. Cut their heads off from the left. At his side there is a stick. Strike it on thy knee and break it. From inside it a lamp will come out. Put it into the water, and his life will go out (of him). If thou wert to put him in pieces fine as millet seed, he would not die. If thou omittest not one of these (instructions), he will die." *Alà-àspa* performed these instructions. The span-high one died.

50. Forty keys of his were (hanging) on pegs. He took them, and immediately began to open the doors. He opened them all, (till but) one remained. He came and at once opened this and went in. A beautiful (damsel) was there. Neither the sun entered to her, nor the moon. 51. She immediately began to weep and said, "Oh youth! why dost thou work thine own perdition?" He answered, "For love of one hair of thine. What doest thou there?" She said: "I was seven years old (when) the span-high one stole me, and brought me and made me fast here." He said, "Be happy, I have killed him." She answered, "It is not easy to kill him; if thou wast to make him (into pieces) the size of grains of millet he would not die." *Alà-àspa* said, "Let us go; see I have killed him." He took her by the hand and they came. She looked; he was dead.

52. Then they sat down that evening. They ate their meal. (Then) they came to sleeping. He drew his sword and threw it (down) between (them). She said, "Why doest thou thus?" He answered, "I have received (this) counsel of my father. As long as I have not reached my home, I do not ungird myself." Then they slept. 53. In the morning he loaded up the wealth of that (creature). All of it he loaded up. They came to the mouth (bottom) of this pit. (*Alà-àspa*) shook the rope, and tied the things one by one, and (the wazir's son) pulled (them up). At last he finished hauling, and (*Alà-àspa*) brought that Beauty (to the rope). The

\* I. e. "there is not room for a bird even to get in and steal."

† A common reply to an impertinent question. Lit. "Whatever may be (the case), by my fate I have come here."

wazir's son pulled. At one sight of her face, (he fell) in love as if he had beheld her a hundred times. 54. Alà-àspa had kept a black sheep by him. By way of a trial, he made the rope fast to it and said: "Pull well, it (is) I." (The wazir's son) pulled, (till) a cubit remained. He saw a black sheep. Then he cut the rope. (The body of the sheep) struck (the ground) in front of Alà-àspa, and was (dashed) to pieces. 55. Then he wept much, and said: "Alas for the world. For the sake of that Beauty, he has treated me so."

56. Then the wazir's son repented himself, saying: "(Why) did I not take him out?" He returned and came to the mouth (head) of the pit, and threw down the rope to Alà-àspa, who seized the rope: the other pulled, Alà-àspa came out. They embraced one another, and wept much. 57. Alà-àspa said: "Brother, why didst thou so? Thou hast become in love with the Beauty, in love with the goods of this world." The other replied: "Whatever has happened, has happened so." They went into the castle. 58. The wazir's son said: "Come, let us divide (the goods). Alà-àspa said: "Do thou make the division." The wazir's son began to divide, and takes for himself what is large and good; the refuse he gives to the other. Alà-àspa said: "This woman is now thine, these goods are now thine, I want them not." Even his own share he gave to him. 59. He said: "Do thou sit still, I will go and bring thee the white falcon." He sat still, and Alà-àspa went off. A certain space of time passed. He went into a town, he took a white falcon and came (back). He came and remained there for the night, in the morning he said: "Let us start." They ate their food and saddled their horses, and started.

60. They went a certain distance of road. Then they arrived at the bank of that river. Alà-àspa said: "Here I say good-bye." The wazir's son said: "Come, let us divide these goods." Alà-àspa said: "No, by thy mother's milk (they are) a gift to thee. And I have one bargain (to make) with thee. If thou perform that same for me, I am satisfied with thee in this world and in the next. Make me the promise. 61. The bargain is this. (When) thou hast gone and made thy marriage, and arrived at the throne of prosperity, and art about to sleep, put out thy foot to thy wife and say: 'Pull off my sock.' When she has pulled off one, say: "Woi-Diregh! (Ah, alas!)" If thou doest that so, I (shall be) well pleased with thee."

62. Alà-àspa went on his way (direction). The wazir's son came to his own place. They carried the news to the king, that the wazir's son has come and has brought a white falcon. The king gave that man the reward of good news. 63. The wazir's son arrived and entered the king's presence. He took the falcon and went in. The king arose from his place. He gave him the salutation of a friend. He took the falcon on his

hand, and said : " Wazîr's son ; thou hast had much trouble. Go (and repose) in thy house."

64. He went home. His mother saw him and rejoiced much. That night he remained (there) and in the morning he took up (the arrangements for) his wedding. Men assembled together. They made a wedding feast for five days. The king did not give such a feast, as the wazîr's son gave. 65. The next day they celebrated the marriage. He took his wife and went home. On going to bed he put out his foot to his wife and said : " Pull off my sock." She pulled off one : He said : " Woi Dirègh (Ah ! alas !)," and his wife said : " What is this ? If thou hast taken Woi-Dirègh (to wife), why didst thou take me ?" 66. He said : " Woi-Dirègh is a man, not a woman." She said : " No, a woman. That same day that thou wentest forth, she at the same time went. I and she studied at school together." He said : " If that be so, I do not want thee at all." 67. He put on his sock (again), and mounted his horse and went forth that same night. At last it became light. A flock of sheep met him. He saluted (the shepherd) and said : " Whose is this flock ?" (The shepherd) replied : " Woi-Dirègh's." 68. Thence he went on ; a camel-herd met him. He said : " Oh camel-herd ! whose are these camels ?" He answered : " Woi-Dirègh's." Thence he went on, a cow-herd met him. He said : " Whose are these cattle ?" He replied : " Woi-Dirègh's."

69. He went on ; a garden came (in sight) in front of him. He asked : " Whose is this garden ?" The gardener answered " Woi-Dirègh's." The gardener had (has) taken some flowers in a vase. His face was away from (the wazîr's son). The latter took off his ring and hid it in the midst of the flowers. The gardener took (them) up and went away. 70. He took the flowers to Woi-Dirègh. She had thrown herself on to a couch. He took up the flowers to her. She said : " Oh gardener, thou hast brought wonderfully sweet-smelling flowers." 71. Then she took the flowers and opened them out. The ring came out. She said : " Oh gardener, who is in the garden ?" He answered : " Oh lady ! a person came into the garden." She said : " Speak not of flowers (compared) with his face."

72. The wazîr's son came out of the garden. He came to the castle gate. A maid came out for water. He came and sat by the side of a bush. The maid came and fetched water. 73. He said : " Oh maiden, give me some water." She said : " Art thou not a wonderfully foolish person ? Woi-Dirègh is fairy-born. How shalt thou drink water in her cup ?" (So) she would not give him any water, (but) she took her water and went off.

74. She had not gone a yard (when) her water turned into blood. She poured it away and came again and fetched (more) water. He said : " Oh maiden, give me water." She did not give him (any). 75. Again she went

to the (same) spot and (the water) became blood. Again she poured it away. Again she came and fetched water. He said: "Oh maiden, give me water." She did not give it.

76. He said: "Oh maiden, if thou takest it till to-morrow, thou wilt not make the water reach her presence. Give me water." (She) filled the cup and handed it to him. A drop he drank, (and) threw his ring into the cup. He spread his handkerchief over the water, and said: "Open not its mouth (lit. head), (but) convey it to Woï-Dirègh."

77. She brought it and (Woï-Dirègh) said: "Ah! how dost thou bring water! 'To-day has become to-morrow.'" (The maid) said: "I have a matter to represent to thee; after that do whatever (thou wilt) to me." And she took up her tale: "So now whatever thou mayst do to me, thou art great [*i. e.* thou art the mistress]. 78. [Woï-Dirègh] said: "Go call [him]." [The maid] went out [and] called him. Then he entered and saluted [her]. She got up from her couch to [meet] him. Then she took him up and placed him at her side. 79. After some time [she] said to the maid: "Go call the Mullà." She went and called [him]. The Mullà performed their marriage to one another. They attained to the throne of prosperity. May we also attain to [and partake of] your good fortune!

### A SHORT VOCABULARY OF THE SHIGHNI DIALECT.

| A.                    |                     | B.                    |                  |
|-----------------------|---------------------|-----------------------|------------------|
| to be able            | vardh-(ao)          | back (subst.)         | dàm              |
| again                 | vào, vôi            | bad                   | ganda            |
| to alight, to descend | khhavd-ao           | a bank (of river &c.) | zimb             |
| all                   | fuk                 | barley or grain in    |                  |
| also                  | mis                 | general)              | chustj           |
| and                   | et                  | to be                 | vîd-ao           |
| apricot               | nàsh                |                       | vày-am (yast-am) |
| to arise              | andùid-ao           |                       | vòd-am           |
| to arrive or to cause |                     |                       | vudhj            |
| to arrive             | firibt-ao (Inf.)    | a bear                | yurskh           |
|                       | firàb-am (Prest.)   | a beard               | bon              |
|                       | firebt-am (Past)    | to become (to gò)     | sit-ao           |
|                       | firebtj (Perft. P.) |                       | sào-am           |
| an arrow              | surb                |                       | sut-or sat-am    |
| to ask                | pekhst-ao           |                       | sudhj            |
| at once               | mis                 | a bed, bedding        | birej            |
| an augury             | fàl                 | before                | parào            |

|                     |                 |
|---------------------|-----------------|
| behind (adv.)       | zabô            |
| behind (p. p.)      | tar—zabô        |
| to bind             | vist-ao         |
|                     | vùst-am (Past)  |
| a birch tree        | brùj            |
| black               | tèr             |
| blood               | wikhîn          |
| body                | tanà            |
| bone                | sitkhân         |
| bottom              | bon             |
| to bow the head     | khambind-ao     |
| abow (for shooting) | tsan            |
| a boy               | gadhà           |
| bread               | gardhà          |
| to break            | vrukht-ao       |
|                     | varagh-am       |
|                     | vrukht-am       |
|                     | vrukhtj         |
| the breast          | sîna            |
| to bring            | vid-ao          |
|                     | vâr-am, vir-d   |
|                     | vùd-am          |
|                     | vùdj            |
| a brother           | vrôd            |
| a bull              | nîr skhîj       |
| to burn             | tebd-ao         |
|                     | also sùkhtan p. |

## C.

|                   |             |
|-------------------|-------------|
| a calf            | shik        |
| to call           | kiw chîd-ao |
|                   | kiw-am      |
|                   | kiwd-am     |
|                   | kiwdj       |
| a camel           | skhtur      |
| to carry, to take |             |
| away.....         | _____       |
|                   | yoss-am     |
|                   | yôd-am      |
|                   | yôdj        |
| cattle (horned)   | stôr, pâda  |
| to clean          | zanéd-ao    |

|                      |                  |
|----------------------|------------------|
| to close (one's eyes |                  |
| or mouth)            | bidhemd-ao       |
|                      | bidhemd-am       |
|                      | bidhemdj         |
| to come              | yet-ao           |
|                      | yâd-am, yâdh     |
|                      | yat- or yett-am  |
| to come out          | naskhtid-ao      |
| to command, (to      |                  |
| send)                | (Past Tense) r   |
|                      | mâd-am           |
| to cook, also to     |                  |
| ripen .....          | pekht-ao         |
|                      | péz-am           |
|                      | pekht-am         |
|                      | pekhtj           |
| a corpse             | murdhà           |
| to cover             | bighin chîd-ao   |
|                      | bidhem-am        |
| a cow                | jâo, stôr        |
| cream                | marôb            |
| a crow               | khurn            |
| a cubit              | chuv-gaz         |
| to cultivate         | cheridz-ao       |
| a cup                | virik            |
| to cut, to cut off   | (skhchukht-ao ?) |
|                      | skhchand-am      |
|                      | skhchukht-am     |
|                      | skhchukhtj       |

## D.

|            |                  |
|------------|------------------|
| daughter   | razîn            |
| dawn       | rukht            |
| to dawn    | rukht dhéd-ao    |
| day        | meth             |
| demon      | dhéw             |
| to descend | wedhd-ao         |
| to die     | mîd-ao           |
|            | (mir-am ?) mir-d |
|            | mûd-am           |
|            | mùghj            |
| •          |                  |
| distribute | baskh chîd-ao    |

|                            |                    |                        |                        |
|----------------------------|--------------------|------------------------|------------------------|
| to do, to make             | chîd-ao            | a finger               | angaskht               |
|                            | kin-am             | fire                   | yâts                   |
|                            | chûd-am            | a fire-place, hearth   | kitsâr                 |
|                            | chùgĵ              | five                   | pinz                   |
| a dog                      | kûd                | to flee                | (Past Tense) rat-      |
| a door                     | divé               |                        | sust-am                |
| to draw                    | (tiẓd-ao ?)        | a flock                | ràmà                   |
|                            | tàẓ-am             | flocks and herds       | mâl                    |
|                            | tiẓd-am            | a flower               | gul                    |
|                            | tiẓdj              | a flower-pot           | lagan                  |
| to drink                   | brekht-ao          | to fly, to rush, (to   |                        |
|                            | brèz-am            | burst)                 | (Past Tense) za-       |
|                            | brokht-am          |                        | bôd-am                 |
|                            | brokhtĵ            | food, provisions       | tuskha                 |
| to drop, to alight         | khhavd-ao          | a foot                 | pâdh                   |
| dry                        | kâk                | four                   | tsavòr                 |
|                            | E.                 | a frog                 | shèr-bîch              |
| an ear                     | ghokh              | fuel                   | ẓiz                    |
| earth, ground              | zems               | full                   | lap                    |
| to eat                     | khhé-d-ao          |                        | G.                     |
|                            | khhùd-am           | a gate                 | darvâza                |
|                            |                    | a gift                 | piyil                  |
|                            |                    | to give                | dâ chîdao, <i>or</i>   |
| eight                      | waskht             |                        | dhéd-ao                |
| to enter                   | .....              |                        | dhi-am                 |
|                            | dedh-am            |                        | dhàd-am                |
|                            | déid-am            |                        | dhâdj                  |
|                            | (dedhj ?)          | to go, (to become)     | sit-ao                 |
| to cause to enter          | (Perf. Participle) |                        | sào-am                 |
|                            | diodhj             |                        | sut- <i>or</i> sat-am  |
| a ewe                      | magh               |                        | sudhj                  |
| an eye                     | tsem               | to go (indef.), to     |                        |
| an eye-brow                | vrugh              | walk                   |                        |
|                            | F.                 |                        | ti-am                  |
| a face                     | pîts               |                        | tùid <i>or</i> tòid-am |
| a father                   | ped, âtà T.        |                        |                        |
| female                     | stredz             | to go out <i>or</i> up | ' naskhtid-ao          |
| to find, to receive, ..... |                    |                        | naskhti-am, naskh-     |
| to obtain                  |                    |                        | tîst                   |
|                            | varé-am            |                        | naskhtuid-am           |
|                            | vùd-am             |                        |                        |
|                            |                    | a goat                 | vâz                    |

|                   |                                  |                    |                             |
|-------------------|----------------------------------|--------------------|-----------------------------|
| good              | bàshànd                          |                    | L.                          |
| a grandson        | nebòs                            | a lady             | bébé                        |
| grass             | woskht                           | a lamb             | warg                        |
| great, big        | kattà, kattanàk r.               | a lamp             | tsirao                      |
|                   |                                  | a leaf             | pàrg                        |
|                   | H.                               | to learn, to read  | [Past Tense] skhè-<br>id-am |
| hair              | ghunj                            |                    |                             |
| a hand            | dhöst                            | a leg              | ling                        |
| he                | yü                               | to lick            | dhikt-ao                    |
| a head            | kal                              | to light           | pedhéd-ao                   |
| to hear           | skhíd-ao                         | little, small      | dzülikik                    |
|                   | .....                            | a little morsel or |                             |
|                   | skhùd-am                         | drop               | lav                         |
|                   | .....                            | a load             | wiz                         |
| heart             | zràdh                            | to look            | cheskht-ao                  |
| a herdsman        | chupân, pàda-bân                 |                    | ches-am                     |
| here              | yundé, ikyund,<br>taròd          |                    | chùskht-am                  |
| to hide           | (Past Tense] ru-<br>bùid-am      | to lose            | chùskhtj<br>binest-ao       |
|                   |                                  |                    |                             |
| a horse           | vorj                             |                    | M.                          |
| a herd of horses  | galla                            | a magpie           | kshebts                     |
| a house           | chid                             | to make, to do     | chíd-ao                     |
| how?              | tsi-rang                         | male               | nîr                         |
| hungry            | guskhna                          | a man              | chorik                      |
| hunting, sport    | ghiéw                            | meeting [adv.]     | dichâr                      |
|                   |                                  | middle [subst.]    | medhóna                     |
|                   | I.                               | milk               | skhuvd                      |
| I [pron.]         | wuz, <i>also</i> am [see<br>Gr.] | to milk            | dhùid-ao                    |
| in, into          | tar                              | millet-seed        | pinj-dâna                   |
| iron              | spin                             | month              | inèst.                      |
|                   |                                  | moon               | mèst                        |
|                   | J.                               | mother             | mâd                         |
| to join, to unite |                                  | mountain           | tàkhh                       |
| [intr.]           | jaosar sit-ao                    | mouth              | ghaiv                       |
|                   |                                  | much, many         | lap                         |
|                   | K.                               | moustache          | burùt r.                    |
| a key             | skhidz                           |                    |                             |
| to kill,          | zíd-ao                           |                    | N.                          |
|                   | zîn-am                           | name               | nâm                         |
|                   | zíd-am                           | neck               | gardhân                     |
|                   | .....                            | new                | nàu                         |
| the knee          | zân                              | night              | skhab                       |

|                     |                                           |            |                         |
|---------------------|-------------------------------------------|------------|-------------------------|
| nine                | nào                                       | to remain  | [Past Tense] róid-am    |
| noise               | sadà                                      |            |                         |
| nose                | nèdz                                      | to return  | wazivd-ao               |
| now                 | shich                                     | a river    | skhats [ <i>water</i> ] |
|                     |                                           | a road     | pònd                    |
|                     |                                           | a rock     | zìr                     |
|                     |                                           | a rope     | kamand                  |
|                     |                                           | to run     | [Past Tense] zekht-am   |
|                     | O.                                        |            |                         |
| odour               | bòi                                       |            |                         |
| one                 | yìw, yì, í                                |            |                         |
| one by one          | yìwi yìwi                                 |            |                         |
| open                | het                                       |            |                         |
| other               | gà, gad [obl.]                            |            |                         |
| outside             | vàj                                       |            |                         |
|                     | P.                                        |            |                         |
| to pass             | [Past Tense] nagh-jìd-am                  | a saddle   | bidhàn                  |
|                     |                                           | to say     | levd-ao                 |
|                     |                                           |            | lòv-am                  |
|                     |                                           |            | lòvd-am                 |
|                     |                                           |            | lovdj                   |
| people              | khhalq                                    | to see     | wint-ao                 |
| a pine tree         | ambekhts                                  |            | win-am                  |
| a pocket            | jèb                                       |            | wind-am                 |
| a portion, a share  | baskh                                     |            | windj                   |
| to pour [tr.]       | tis chid-ao                               | to seize   | [Pres.] injàv-am,       |
| praise              | stàuakh                                   |            | [Past] injuvd-am        |
| presence            | khèz                                      |            |                         |
| publicly            | marakan                                   | self       | khu, khubath            |
| to pull             | [tizd-ao ?]                               | to send    | bekht-ao                |
|                     | tàz-am                                    |            | bàz-am                  |
|                     | tizd-am                                   |            | bokht-am                |
|                     | tizdj                                     |            | bokhtj                  |
| to pull out         | [Past Tense] pik-ed-am, also nakh-vend-am | seven      | wuvd                    |
|                     |                                           | to shake   | jumbind-ao              |
|                     |                                           | she        | ya                      |
| to put, to put by   | là chid-ao                                | a sheep    | jândâr                  |
| to put on [clothes] | [Past Tense] pinù-id-am                   | a shepherd | chupân                  |
|                     |                                           | a shoulder | sivdh                   |
| putrid              | pudhj                                     | side       | pàlé, yimb              |
|                     | R.                                        | to sit     | .....                   |
|                     |                                           |            | neth-am                 |
| rain                | barân                                     |            | nùst or nâst-am         |
| to raise [the head] | [Past Tense] sind-am                      |            | nùstj or nâstj          |
|                     |                                           |            | nùstjin                 |
| a ram               | yirk, maghij                              | sitting    | khhauskh                |
| a wild-ram          | mèshak                                    | six        | dâdh-gad                |
| a ravine            | shervidâj                                 | size       |                         |

|                              |                                                            |                             |                                                          |
|------------------------------|------------------------------------------------------------|-----------------------------|----------------------------------------------------------|
| a slap                       | skhkufta                                                   | this                        | yam, yem [ <i>obl. mi</i><br><i>di</i> ] <i>Pl. dath</i> |
| sleep                        | khùdhm                                                     | this very                   | ikyam                                                    |
| to sleep                     | skhevd-ao                                                  | thirsty                     | tâskhna                                                  |
|                              | .....                                                      | three                       | àrrai                                                    |
|                              | skhovd-am                                                  | thou                        | tu                                                       |
| small                        | skhovdj                                                    | to throw                    | [ <i>Past Tense</i> ] pat-<br>téwd-am                    |
| a smile                      | dzùlikik                                                   | thus, like this             | dis, idis                                                |
| to smile                     | shunj                                                      | to-day                      | nur                                                      |
|                              | [ <i>Past Tense</i> ] shind-<br>am                         | to-morrow                   | végà                                                     |
| snow                         | zini                                                       | tongue                      | zév                                                      |
| son                          | puts                                                       | tooth                       | dhendân                                                  |
| to spread                    | wedhd-ao                                                   | towards                     | tar — pâlê                                               |
| a star                       | skhtardz                                                   | town                        | skhâr                                                    |
| to steal                     | [ <i>Past Tense</i> ] tsift-<br>am                         | to transfix                 | tis chid-ao                                              |
| a stick                      | mâth                                                       | to treat [ <i>behave</i> ]  | [ <i>Perf. Part.</i> ]<br>jinàutj                        |
| stomach                      | kích                                                       | trouble, toil               | m                                                        |
| a stone                      | zir                                                        | to turn [ <i>intr.</i> ]    | gardh-ao                                                 |
| straightway, at<br>once      | mis                                                        | to turn [ <i>tr.</i> ]      | .....<br>wizäfts-am<br>wizivd-am                         |
| to strike                    | dhód-ao<br>dhâd-am, [ <i>3rd dé</i> ]<br>dhâd-am<br>dhâdhj | to turn aside, to<br>depart | [ <i>Past Tense</i> ]<br>gaskht-am                       |
| to study, to learn           | [ <i>Past Tense</i> ]<br>skhéid-am                         | to twist <i>or</i> spin     | .....<br>teb-am<br>tebt-am<br>.....                      |
| such, like that              | dund, idund                                                | two                         | dho                                                      |
| the sun                      | khhèr                                                      |                             |                                                          |
| a sword                      | midhj                                                      |                             |                                                          |
|                              | T.                                                         |                             | V.                                                       |
| ten                          | dhis                                                       | a vessel, pitcher           | taghâr, tothch                                           |
| time [this time pith<br>&c.] |                                                            |                             | W.                                                       |
| that                         | yü [ <i>obl. wi</i> ], <i>Pl.</i><br>wâdh                  | the waist                   | midh                                                     |
| that very                    | ikyui                                                      | a waist-band                | miend                                                    |
| then                         | dedh                                                       | water                       | skhats                                                   |
| thence                       | az-um, az-um-andé                                          | a water-course              | wiedh                                                    |
| there, therein               | yum-andé, ikyum-<br>andé                                   | we                          | mâsh                                                     |
|                              |                                                            | to weave                    | wift-ao                                                  |
|                              |                                                            | a wedding feast             | sur                                                      |

|          |                         |           |               |
|----------|-------------------------|-----------|---------------|
| to weep  | niwd-ao                 | who ?     | chài, chi     |
|          | .....                   | why ?     | chiz, chiz-ar |
|          | niùwd-am                | wife      | ghin, zin     |
|          | .....                   | woman     | ghin, kàkhoi  |
| well     | bàshànd ( <i>good</i> ) | wool      | wùn           |
| what ?   | kà, chiz, tsiz          | work      | kàr           |
| whatever | tsèi                    | to write  | nevish-an     |
| wheat    | zindam                  |           |               |
| where ?  | kàiyi                   |           | Y.            |
| whew     | pài                     | yesterday | biyàr         |
| white    | sufèd                   | you       | tamà          |

*N. B.*—No special mark has been put against the Persian and Arabic forms.

*The Mythic History of the God Viráj.*—By G. S. LEONARD, *Assist. Secretary, Asiatic Society, Bengal.*

In giving an account of the god Viráj, the deity worshipped in the form of the universal world, and forming one of the ten supernatural beings in the scale of the creative agents, we have to consider him in the three-fold light of history, mythology, and theology, in all of which he makes a conspicuous figure in the original works of India.

The great variety of discordant accounts found in the Puráṇas and elsewhere, regarding the genesis of Viráj and his historical and mythological traditions make it extremely difficult to form a correct and distinct idea of his personality, to ascribe to him a definite shape and form, to depict his real figure, like that of any other god in the Hindu Pantheon, and to attain to a knowledge of the doctrines his religion inculcates.

Viráj, as we learn from the different accounts of his genesis, does not appear to have a prior or separate existence of his own apart from nature, to entitle him to an independent entity or personality. His body, unconfined by any dimensions, cannot possibly admit of any distinct shape or form. And the doctrine taught in the established form of his worship is not composed of the creed of a particular deity, nor professed by a set or sect of people among the numberless schisms of the Hindus, nor is it capable of a distinct delineation.

So great is the confusion in the gradation of persons, as has been justly remarked by Moore in his Hindu Pantheon, that it presents us Viráj in different degrees of relationship to Brahmá the creator. Manu mentions him as the offspring of the latter, when the Brahma Vaivarta Puráṇa repre-

sents him as progenitor of the same. He is stated in the Institutes as father of Svayambhuva Manu, while in the Matsya and Padma Purāṇas we find him identified with the latter. The Brahma Vaivarta again represents him as the offspring of Rādhā and Kṛishṇa, and presents us with a multiplicity of minor Virájs (Kshudra Viráts) proceeding from the elder one (Mahá Virát).

The epithet of the first male (Adi Purusha) agrees with Viráj in one place, and with Brahmá in another; with Náráyana in a third, and with Svayambhuva in a fourth. In one place the hymn addressed to the thousand-headed male (Sahasra Śírsha Purusha) agrees with Viráj, and in another with Brahmá, and elsewhere we find it addressed to Vishṇu or Náráyana. So his wife Satarúpá (Centiforma)—a fit epithet for the consort of Sahasrarúpa, *milleformis*—Viráj is represented in one place as his progenitrix and wife of Brahmá, and in another as a daughter of the same and consort of Svayambhuva Manu, identified with Viráj.

Notwithstanding the inextricable confusion, as shown above, in which the persons of Viráj and his consort are involved, a careful study of the subject and patient inquiry into the mists of fiction, which inseparably attend the character of Viráj in every theory of the Sāstras, will enable us to find the true person of this deity, from the fictitious and pretended ones imposed upon him in sectarian works, each claiming the title for its respective divinity, which it attempts to glorify above the rest. Thus the Brahmites invariably honor Brahmá with that title which the Vaishnavites contend to reserve for their adored Vishṇu or Náráyana, and the Krishnites of late for their favourite deity, as also for his offspring by Rādhā. While on the other hand the Śivites lay a claim to it, not alone for their god but also for his pigmy son Gapeśa, the Janus of the Hindus. They also denominate their goddess Kālī by the name of Satarúpá. The Mánavites or Adamites do not scruple to call the great ancestor of mankind by that august name, and the great mother of the human race by that of Satarúpá.

In the Vishṇu Purāṇa, says Dr. Wilson, "Vishṇu is said to be the first Purusha or spirit who, in association with Pradhánā—matter, becomes male and female, *i. e.* active and passive energies for the creation of the world in the egg." "This system," adds he, "is conformable to that anciently maintained as explained in the opening of Manu, substituting Vishṇu for Brahmá." The same sort of reasoning applies in the case of Viráj also, who is represented, (*vide* Moore's Pantheon) to be a bifurmed being half male and half female, sometimes joined together and at other times in separate forms. In disregard, therefore, of the persons, severally designated with the title Viráj (for we find not only the other gods but potentates of the earth oftentimes honored with that title), and in exclusion of every consideration respecting the different forms in which he is exhibited, we must satisfy our

curiosity concerning him with a bare description of his nature and attributes, according to the import of the word and its definition given in the Śāstras, with an exposition of the system of religion which is promulgated under that name in the Purāṇas and the Vedānta, together with its analogies in other Asiatic and European systems.

Viráj, as the word signifies (virajati = *regit* from the root 'rajri' = *regere*) means the ever-reigning ruler or sovereign of the universe, be he whoever he may, whose entity is composed of three natures: viz. the intellectual or *chaitanya*, the spiritual or *Vāisbānara*, and a concrete gross nature, *sthūla śarīra*, which respectively constitute his omniscience, omnipotence, and omnipresence throughout the utmost bounds of existence. He is also considered as Viśva constituting the individual souls of the Viśvedevās or different orders of gods or supernatural beings which subsist in him, and is sometimes represented as Mahá = *magnus* or Kshudra = *parvus* in the relation of father and son, as he fills a greater or lesser sphere, the whole universe or a part, and both of the same nature and properties.

Such being the import of the word according to its definition, Viráj proves to be the lord of the universe coeval with its creation, but whose essence, instead of dying away with the dissolution of the material world, as the Pantheist says, will continue for ever with the entity of its divine origin to all eternity. He proves also, from the joint testimony of the Śāstras given in the following pages, to be the automaton or moving principle of the visible world, whose body, as the poet figuratively expresses it, "is nature, and whose soul is god." He may be called both great and small, agreeably to our conception of him presented to our enlarged or limited faculties; and as infinity is beyond the conception of a finite being, we, for the sake of meditating on his nature, can assign to him a greater or a lesser magnitude of a whole or part, according to the powers of our understandings, for he is "as great in the earth as in the ethereal frame." The form of Mahavirát is no more than the macrocosm of European philosophers, which comprehends the whole of the visible world, and the Kshudra-virát agrees exactly with the microcosm of metaphysicians, which Dr. Reid, like the Vedántists, applies to Man or Manu who is an aggregate of the intellectual and physical natures of Viráj. The obvious manifestation of the deity in the face of nature, though of itself evident to the meanest understanding from every object of creation by which on all sides we are beset, is yet so mystified by the reveries of theologians, and the rhapsodies of philosophers on the one hand, and so diversified by the discordant descriptions of poets and obscured by the conflicting accounts of mythologists on the other, that this confused chaos of abstract mysticism of the Vedānta, and the contradictory myths of the Purāṇas would well nigh destroy each other, and leave a void in the belief of the Virájian religion, as it has

already done in the minds of the vulgar and ignorant, had not the irresistible light of natural theology showed its superiority over every other scheme of religion to the saints and sages of all ages and countries, and preserved its relics among the learned and superior classes of the Hindus. The truth of the self-manifestation of the deity in the universe forms the pith and marrow of the Virájian doctrines, (Virádmata) and is in unison with the true, rational, and natural religion of all mankind, whether deduced *à priori* from a pre-existent cause to his work, or inferred *à posteriori*, from the works of nature to a superintending agent.

The deduction of Virájism from its fountain head of Brahminism by the analytical method pursued by the Vedánta like all other ancient schools, is not only too abstruse for common comprehensions, but too intricate and mazy on account of its concatenation of causes and effects to several successive steps or gradations of being. I have therefore followed the modern method of induction in the investigation of Virájism as it is presented to us, and then attempted to resolve it to the main source whence it sprung. "The world subsists in and is the abode of God," is a main tenet of the Virájian theology; and the universe like a mirror not only reflects God's image, but refracts it to every observer in it. The want of such a display of divine attributes either in the works of nature before us, or in the construction of our intellectual, mental, and bodily faculties, would undoubtedly lead us to form a very different ideal of divine nature—different from the light of nature, and therefore of truth, and as different from each other as those propagated by the false dogmas of pretended revelations, and as various and uncertain as those introduced by the endless speculations of philosophers. A religion or system of doctrines teaching the mysteries of divine nature inconsistent with the light of nature, may seem too grand and sublime to common capacities, too amusing to the speculative, and may be also very good in the abstract, but it can neither appeal to our comprehensions unless justified by the light of nature, nor be of practical use to us, unless it appeal to our own natures and the nature of things. The pure mysticism of the Vedánta and Súfism, and the ideal spirituality of a Plato, a Berkeley, and others, may be suitable to intellectual and spiritual beings of higher orders placed in other spheres as cherubs, seraphs, and other denominations of the holy choir; but a being of this material world, confined to this sublunary sphere, requires a religion adapted in every sense to his comprehension and well suited to his nature, as that inculcated by the Virájian or natural theology.

The admirable Sir W. Jones has given us an extract of European theology from the writings of the illustrious Mr. Neckar which I shall quote in this place as best calculated to give a just idea of the Natural theology of Viráj in the glowing language of a modern philosopher. "*Considering themselves as an emanation from that infinite Being, they*

would cherish the idea of a God, who created, who regenerates, who *preserves* this universe, by invariable laws, and by a continued chain of similar causes, producing similar effects, who pervades all nature with his divine spirit, as an universal soul, who moves, directs, and restrains the wonderful fabric of this world. The blissful idea of a God sweetens every moment of our time, and embellishes before us the path of life; unites us delightfully to all the beauties of nature, and associates us with everything that lives or moves. Yes; the whisper of gales, the murmur of waters, the peaceful agitation of trees and shrubs, would concur to engage our minds and *affect our souls with tenderness*, if our thoughts were elevated to *one universal Cause*, if we recognised on all sides the works of *Him whom we love*, if we marked the traces of his august steps and benignant intentions, if we believed ourselves actually present at the display of his boundless power, and the magnificent exertions of his unlimited goodness."

I am confident that the Súfi and Vedántist would consider this rhapsody as an epitome of their common system, for they concur in believing the Spirit of God to pervade the universe, and to be always immediately present in his works, and consequently always in substance, and the souls of men (jiva) though differing infinitely in degree, yet not at all in kind, from the divine Spirit of which they are particles in which they move, and in which they will be ultimately absorbed.

The ubiquity of the divine Soul containing the grand arcanum of the Vedánta and Súfi theologies, is the invariable theme of oriental poetry and philosophy, for when the Veda says "He is in and yet out of all", it fully agrees with the Urdú poet Mír Hasan in maintaining his spiritual presence in all material bodies, yet different from all matter :

"He is neither in the stone nor in the gem,  
Yet shines alike in every hue the same."

And while the Vedántist in his ecstasy beholds everything as an image of his Maker, the Súfi, in his religious rapture, sees nought but the essence of his God spread all around him.

But the advocates of Pantheism are apt to construe the inseparable union and diffusion of the essence of Viráj over the material world, whether exhausted or unexhausted in nature, as a real, material, and physical pantheism, and the untangible universality of Vaisvánara (Ζωτικός) the vivifying and animating soul of the universe, as a spiritual, ideal, and intellectual pantheism. But in the zeal of maintaining their favourite theories they entirely forget, that the perfect, immaterial, and incorruptible essence of a spiritual nature, though so closely connected with the material world, as supporting, sustaining, vivifying and moving all its parts for evermore, cannot be assimilated to imperfect, gross, dense, and motionless matter, by its pervasion over the whole, which means but the omnipresence of the

spiritual essence and not its transubstantiality into matter. For the text says "The spirit of Viráj, presiding over all material forms, is said to be embodied in the shape of the universe, but when that ever wakeful soul is said to preside over individual souls on earth, he is understood as a superintending spiritual substance." The Commentary on the above passage states: "Viráj Purusha's filling the world with his substance signifies, his presiding over individual souls in a divine and not material form." This explanation proving the spirituality of Viráj's essence, keeps him aloof from the charge of materialism.

The atheistic pantheism of Spinoza maintaining the absorption of the infinite god (Brahm) in nature is entirely ignored by the Vedas, for it has been inveighed against by Dr. Rájendralála Mitra in the introduction to his English version of the Ch'hándogya Upanishad, where he maintains a Theistic Pantheism by upholding the existence of the finite world in the infinite essence of God. "Uddálaka," says he, "instead of supposing with pantheists the absolute consubstantiality of God and Nature,—of God and the whole universe being of one and the same substance—makes the Deity create the universe first, and then shed out as it were, a ray of his light. His doctrine in short, is not the absorption of the infinite into the finite—of God in Nature—but of the finite in the infinite—Nature in God." Spinoza with his iron logic has fallen into a downright fallacy by supposing the extinction of the divine essence and personality by their pervasion or diffusion over the universe, because the Veda, granting even the infinity of the universe, declares God is perfect and so is the universe which is derived from him, as a prototype of the divine archytype. The subtraction of the perfect from the perfect leaves the remainder perfect. This doctrine of the Veda though a seeming paradox, is however true of infinite quantities, for if you take infinity from infinity, the remainder is also infinity.

The terminology of the Vedas using the word emanation for causation or creation, and diffusion and pervasion for omnipresence, as also the use of the ablative case for the instrumental, has oftentimes misled the learned to understand the Vedántic theism as a material pantheism. But the literal acceptation of such grammatical and verbal terminations cannot fail also to bring the charge of pantheism home to the Bible and other sacred writings, where the language is glowing and elevated.

Virájism is sometimes liable to the charge of finitism, from not having existed prior to the creation, but being coeval with the existence of the finite world, to which he is said to be subservient as the world is subservient to him. All this is very true, because Viráj had no being before the creation of the world, but the Eternal Being that had an existence before creation manifested himself either as Viráj or governor of the world after he had created it, or emitted a spark of himself for presiding over it. In the

former case it must be infinite and in the latter case it is equally so, being an effluence of the same nature, wherefore he is called *Avyaya* or imperishable, even after the dissolution of the world.

From the above reasoning, Virájism falls under the charge of a third kind of Pantheism, called the Dualistic, ascribing the co-existence of the finite world and its infinite soul, as the passage says "though Viráj is infinite, yet he is inseparably connected with the finite world." But this is a false objection raised by materialists, as two co-eternals and co-infinites are impossible in nature, one of them, *i. e.* the creative power must be anterior to the created object, and united to it in spirit for its government. Hence it is no dualism but monotheism.

Again Virájism is brought under the charge of materialism from Viráj's being the product (*Kárya śarira*) of the partition and combination (*pañcī karaṇa*) of the five atomic principles or elementary bodies of the material world, just as the material force of bodies is produced by the union of substance and particles. But it must be borne in mind that the Viráj spoken of in the *Sāstras* as a *Purusha* or sensible spirit cannot be the result of any mechanical or chemical force: and he is said to be *chaitanya* or intelligent soul, which can never spring from galvanism or electricity. He is styled the mundane soul, which must be a particle or modification of the eternal, self-existent supreme soul of God (*Brahm*).

The multiplicity of divine personages from *Brahm* to Viráj and the plurality of individuals in the person of the latter, *viz.* a *Vaiśvánara*, *Viśvarūpa*, and *Viśva*, all tend to prove both Brahmaisism and Virájism as regular polytheistic systems, notwithstanding their pretensions to simple monotheism.

In refutation of this charge of polytheism I may mention that the Hindus consider these gradations of divine beings, not as so many independent, self-existent persons, but as modifications of the Supreme being, and entirely dependent and subordinate to him for the purposes of creation and the preservation of the universe. The Hindu never ventures to declare them as all co-eternals or co-omnipotents with the Supreme soul. Therefore if the Christian Trinitarian with his creed of three co-existent and self-independent persons in the triad is viewed as a monotheist, why should not the Hindu Unitarian with his faith in the triads be reckoned so likewise?

Another objection that is raised against Virájism with any degree of plausibility, is that of idolatry from the representations given of Viráj in the *Purāṇas*. But is there any possibility of making an idol with a thousand heads, hands, eyes and feet, and whose dimensions are as extensive as nature herself? Does the description of the Being in the *Psalms* "whose canopy is the Heaven and whose footstool is the earth," amount

to idolatry? Does the language of the Bible attributing hands, feet, eyes and ears to the Most High savour of idolatry? The answer is no; these descriptions are but figures of speech. In this case I see no cause why this reasoning should not equally apply to Viráj. Although I have made many personal enquiries and consulted all the authorities on Hindu Mythology known to me, I have been unable to hear of, or discover, any mention of an image of Viráj, with the exception of the colossal figures in the caves of Elephanta, and these are only supposed to represent Viráj.

*Viráj worship.*—The worship of Viráj, like those of the other divinities of the Vedāntic Triad, is positively enjoined in the Śāstras as an essential duty of the twice-born or higher classes of Hindus. It is absolutely requisite for every Bráhmaṇ to recite the Purusha Sūkta or Purusha Medha Sūkta—the Vedic hymn addressed to *Viráj Purusha*—the first male, in his daily rituals, and is as indispensably necessary as the Gáyatrī, the essence of the Vedas, and the creed of all Bráhmaṇs, to be repeated in their daily ablutions and worship of Viṣṇu. There is no Bráhmaṇ, however ignorant he may be, that has not got the Gáyatrī and the first stanza or at least the first hemistich of the Purusha Suktá by heart, to be muttered with his sandhyás or daily prayers in the morning or evening.

The Trinities of the Veda and the Vedānta being much more concerned with the sacred scriptures and theology of the Hindus, than the other deities connected with their mythology, their worship is consequently confined with the learned few, while that of the other is widely spread among the lower classes of the people. Hence the worship of the supreme Brahm, which in the Vedic ages had been popular among Bráhmaṇs, was during the Purāṇic periods, driven to the woods and forests, where it was restricted to religious recluses and ascetics, till it was brought back and its worship re-established among the learned by the celebrated Saṅkaráchárya of the Deccan, and lately introduced among the secular Hindu public by the philanthropic Rámamohana Ráya, from whom the first Bráhma Samáj of Calcutta had its origin, and who was the prime mover in the wide and increasing dissemination of the truths of this primeval religion among the educated and intelligent classes of the people.

The religion of Brahmá too, which had been in full force among the ancient Hindus was latterly supplanted by Śivitism from many parts of India. (*Vide* As. Res., vol. 6.) It was re-established afterwards in the Deccan under the name of Hiranyagarbha adoration, until it was entirely suppressed by the zeal of the Unitarian Saṅkaráchárya, as is mentioned in the Saṅkara Vijaya of Anandagiri, Chap. XI. It was, however, again revived by Mádhava Achárya, under the appellation of Brahma Sampradáya or Mádhváchárya, as Wilson describes in page 87 of his sketches of the "Hindu Sects." The worship of Brahmá as god of fire, or Vulcan of the Hindus, still

continues in Bengal, particularly where incendiaries grow frequent. Brahmā or Hiranyagarbha, says Wilson, is particularly revered at Pokhar in Ajmír, and also at Bithur in the Doáb. Vide id. p. 12.

The worship of Virāj is purely mental, without any visible form, symbol or figure. It was greatly in vogue during the Vedic period, when the Purushamedha and Áśvamedha sacrifices were in use, as the Vedas severally attest. At present the god Vishṇu, the second person of the "mythological triad," and possessing the attribute of the preservation of the world, is identified with Virāj, and worshipped under that name in the Purusha Sūkta hymn. The form of Virāj displayed in the person of Kṛishṇa, an incarnation of Vishṇu, tends also to corroborate this identity. The Mahábhárata furnishes us with instances of the manifestations of Virāj adored by the Páṇḍavas and gods of all orders.

In the Deccan, and particularly at Berar, there is still extant a Virāj-worshipping sect, where notwithstanding the propagation of Hinduism much later than in Northern India, the forms of the ancient and primary modes of worship, with the usages and customs of the Vedic times, are preserved entire from the innovations and changes of the North.

Authorities inculcating the necessity of worshipping Virāj may be quoted in great numbers from different Śástras, but for fear of tiring the patience of the reader with a recital of mere injunctive precepts without their proper formulæ, I will note but a few to show how explicitly a Bráhmaṇ is enjoined to pay his adoration to that deity from the earliest times, in different Śástras. Manu says, the recital of the Purusha hymn exculpates a man from every sin.

"Whoever daily recites the hymn addressed to the Virāj purusha, being solely intent upon him in heart and mind he verily pleases the god, and thereby avoids the miseries of life and obtains the heaven of Vishṇu afterwards."

"Whoever without recital of the hymn to the Purusha, either bathes or worships Vishṇu, all his acts become null and void."

"Who so worships Virāj with recital of the Purusha hymn, and scatters flowers and water upon his offerings, he has verily worshipped the whole universe, with whatever exists or moves in it." (Virāj being an epitome of the whole.)

"Whoso offers flowers or sprinkles water with recital of the Purusha hymn, to the gods, he does them full adoration."

"Let men worship Hari, who is without beginning, middle and end, with the *Yadvishṇu* mantra and *Purusha sūkta* hymn, because in the whole Veda there is nothing like these."

I give below an abridged translation of a few stanzas of the Purusha Sūkta or Universal prayer from the *Áraṇya Gāṇa* of the *Sáma Veda*, taken from "Ward on the Hindus," in Vol. I, p. 289.

" Possessed of innumerable heads, innumerable eyes, and innumerable feet, Bramha fills the heavens and earth and dwells in the human breast. He who knows all, and whatever was, and whatever shall be, and is separate from all. In his separate state he exists in a threefold form above the universe, the fourth part is transfused through the world. He is therefore called the great being ; his command is the water of life. From him proceeded the Virat purusha, He is the source of universal motion ; he is not separate from the universe ; he is the light of the moon, of the sun, of the fire, of the lightning, and of all that shines. The Veda is the breath of his nostrils : the primary elements are his sight, the agitation of human affairs is his laughter, and his sleep is the destruction of the universe. In different forms he cherishes the creatures, as in the form of fire he digests their food ; in the form of air he preserves their existence, in the form of water he satisfies them, in the form of the sun he assists them in the affairs of life : and in that of the moon he refreshes them with sleep. The progression of time forms his footsteps : all the gods are to him as sparks of fire. In the form of fire he cherishes the gods (fire is said to be the mouth of the gods) ; therefore I bow to him who is the universe ; to the gods who dwell in heaven I bow ; to the gods who dwell in space I bow ; to the gods on earth I bow ; to the regent of waters I bow ; to the gods who guard the region I bow."

The Ch'hándogya Upanishad, in Section XVIII, adores him in the following form : " Verily of that All-pervading Soul, the heaven is the head, the sun is the eye, the wind is the breath, the sky is the trunk, the moon is the fundament, and the earth is the feet. The altar is His breast, the sacrificial grass constitutes the hair of His body, the household fire forms His heart, the Annáhúrya-pachana fire forms His mind, and the Ahavaniya fire forms His face."

The Aranyaka Upanishad describes the sacrificial horse as a form of the Virátpurusha.

Manu, in the first chapter of his Institutes, containing both the early Theogony and cosmology of the Hindus, gives the following account of the genesis of the world, and the origin of Viráj, as in the translation of Sir W. Jones :

*Verse 8.* He (Brahm) having willed to produce various beings from his own divine substance, first with a thought created the waters, and placed in them a productive seed :

*Verse 9.* That seed became an egg bright as gold, blazing like the luminary with a thousand beams ; and in that egg he was born himself, in the form of Brahmá the great forefather of all spirits.

*Verse 10.* The waters are called *nárá*, because they were the production of Nara or the spirit of God, and since they were his first *ayana*

or *place of motion* he thence is named Náráyana or *moving on the waters*.

*Verse 11.* From that which is the first cause, not the object of sense, existing *every where in substance*, not existing to *our perception*, without beginning or end, was produced the divine male, famed in all worlds under the appellation of Brahmá.

*Verse 13.* And from it's (egg's) two divisions he framed the heaven *above* and the earth *beneath*, in the midst *he* placed the subtle ether, the eight regions, and the permanent receptacle of waters.

*Verse 32.* Having divided his own substance, the mighty power, became half male, half female, or *nature active* and *passive*, and from that female he produced Viráj.

*Verse 33.* Know me, O most excellent of *Bráhmans* to be that person, whom the male *power* Viráj, having performed austere devotion, produced by himself; Me the *secondary* framer of all this *visible world*.

*Verse 34.* It was I, who, desirous of giving birth to a race of men, performed very difficult religious duties, and first produced ten Lords of created beings, eminent in holiness.

*Verse 35.* Marichi, Atri, Ângiras, Pulastya, Pulaha, Cratu, Prachétas or Daksha, Vasíshttha, Bhṛigu, and Nárada.

*Verse 36.* They, abundant in glory, produced seven other *Menus*, together with deities, and the mansions of deities, and *Maharshis* or great Sages unlimited in power.

*Verse 51.* He, whose powers are incomprehensible, having thus created both me and this universe, was again absorbed in the supreme Spirit, changing the time of *energy* for the time of *repose*.

*Verse 52.* When that power awakes (*for, though slumber be not predicable of the sole eternal Mind, infinitely wise, and infinitely benevolent, yet it is predicated of Brahmá figuratively, as a general property of life*) then has this world its full expansion; but when he slumbers with a tranquil spirit, then 'the whole system fades away.

*Verse 53.* For, while he reposes *as it were*, in calm sleep, embodied spirits, endued with principles of action, depart from their several acts, and the mind itself becomes inert.

*Verse 62.* Swáróchisha, Auttami, Támara, Raivata likewise and Chácshusha beaming with glory, and Vaivaswata, child of the sun."

This account of the creation and the creative powers employed in the process, very nearly corresponds with the description of the creation given in the opening chapter of the book of Genesis, with the slight reversion of the creation of water before that of heaven and earth, which in the Mosaic account is described as *increate*, as *chaos* itself. "The Spirit of God moved on the waters" agrees almost verbatim with the words of the Bible

*va-rūh elohīm merahḥefet 'al-penē tehom.* The spiritual essence is the first developement of the divine soul (Brahm), that which is, filling all infinitude and existing from eternity. All Sanskrit authorities from the Veda to Kālidāsa speak of water as offspring (*nara sūnava*), or first creation (*Srīsh-tirādyā*) of the Spirit of God, which is thence called *Nārāyaṇa*, *Vishṇu*, *Jalāsāyī*, &c., producing the mundane egg within the waters of the deep. This person of the Godhead agrees with the Holy Spirit of the Scriptures, who begat the mundane egg in the womb of the watery abyss, as Milton describes in Books I and VII, of his *Paradise Lost*.

· with mighty wings outspread,  
Dove-like sat'st brooding on the vast abyss  
And mad'st it pregnant.

· but 'on the watery calm'  
His brooding wings the Spirit of God outspread,  
And vital virtue infused and vital warmth,  
Throughout the fluid mass.

The next person is the first-begotten by the Spirit of God under the names of *Brahmā*, *Hiranyagarbha*, *Sūtrātmanā*, &c. He is mentioned as the first male, and described as the creator of everything that was created. This person of the Godhead agrees with the "only begotten Son of God", or rather of the Holy Ghost, as we read in Matthew, "for that which was conceived in her, is conceived of the Holy Ghost." He is spoken of by John the evangelist as the *λόγος* = Word, and Creator of all things. "In the beginning was the Word, the Word was with God, and the Word was God. All things were made by him, and without him was not any thing made that was made."

Hence the *λόγος* is regarded by Platonising Christians as one of the Demiurgic authors of the world, an agent or Aeon, employed by the Supreme Deity in the creation of the universe like *Brahmā*, although the majority of Christians will have the "begotten Son" to be co-eternal with the Father. The last person of the godhead—*Virāj*, must, according to the Bible, be either the image of god "in which created he him," *i. e.* Adam or Adima, agreeing with *Svayambhuva Manu*, the first man according to the *Matsya* and the *Padma Purāṇas*.

The authorities next in importance to Manu are those of the *Purāṇas*, which contain the historical, legendary, traditional, and mythological accounts of the Hindus, and which are invariably consulted by them in all matters concerning history, polity, law, jurisprudence, morality, and religion. The *Purāṇas*, however, are so blended with myths, fables and fictions, that it is hardly possible to separate truth from falsehood. The preceding account by Manu is sufficient for all purposes, as on the authority of the

Vedas it is said to be uncontrovertible, and no authority contrary to it is to be deemed valid.

The *Brahma Vaivarta*, a comparatively recent and *Vaishnavite Purána* in which *Kṛishṇa* is extolled above all other gods, and identified with *Náráyana*, makes *Mahá Viráj* the offspring of that god by his consort *Rádhá* in *Goloka*, and progenitor of *Brahmá*, *Vishṇu*, *Síva*, and other gods. (*Vide* *Aufrecht's* analysis of the said work for his account of *Viraj*, "*Radhae filius Krishnae pars sedecima et ejus progenies.*")

The following account of the nativity of *Viráj* is given in the third chapter of the *Prakriti Khaṇḍa* of the said *Purána*:

"The egg remained in the water a whole age of *Brahmá*, and then on a sudden it burst into twain, from which issued forth an infant bright as millions of suns, a suckling babe, crying with hunger. The lord of the world being thus exposed in the water like a child abandoned by its parents, looked upwards like a helpless orphan. He the Great *Virát*, then swollen in bulk, more than the bulkiest object, became huger than the hugest body, in the same manner as an atom which on the one hand is minuter than the minutest particle, forms the hugest body on the other. He was the receptacle of innumerable worlds, he seemed the Great *Vishṇu* in his nature, and was a sixteenth part of the essence of *Kṛishṇa*. Every pore of the hairs on his body exhibited a world of worlds, which *Kṛishṇa* himself was unable to number. For it may be possible to count the grains of sand on earth, but not the worlds, the *Brahmás*, *Vishṇus*, and *Sívas*, that grew in his person. His body was composed of the universe stretching from the highest *Empyrean* to the lowest *Tartarus*, and called the mundane egg, with *Brahmá*, *Vishṇu*, and *Síva* contained in it."

The same *Purána* gives us two other accounts of the different minor or *Kshudra Virájes*, one of whom was born in a pore of hair in the body of the major and the others in every world which appeared in the pores of hair upon him. The seventh chapter of the said *Purána*, describes the formation of the earth from the body of *Viráj*, in contradiction to that of *Madhu-kaitabha* as *Aufrecht* mentions. "*Terra ex illuvie, quae in corpore Virájis in aqua stantis adhærebat, orta est.*"

The *Matsya Purána*, which has been analyzed by *Aufrecht* in No. 95, of his *Catalogus Codicum Sanscriticorum*, gives the following account of *Viráj* in the third chapter.

"De creatione a Brahmane facta. Cui ut *Sávitṛim* sive *Satarúpám* undecunque intueretur, quatuor (immo quinq̄) facies oriuntur. Eorum filius *Manu Sváyambhuva* (aliis nominibus *Viráj* sive *Adhipúrusha* appellatus) nascitur, a quo reliqui *Manues* descendunt."

That "*Brahma* the creator took *Sávitṛi* or *Satarúpá* for his wife, who bore *Svayambhuva Manu*, who was also called *Viráj* or the First Male, and

from whom the other Manus had descended." That "He the Great Brahma" divided his person in twain and became half male, and half female. This female was severally called by the names of Sāvitrī, Satarúpá, Gáyatrī, and Brahmáñī. That "the soul of the world, *i. e.* Brahmá passed a long time with her and in process of time begat Manu, who is likewise called Svayambhuva and also Viráj the first male." And that he on his turn produced fourteen others Manu, Svarochisva, &c., who had the patronymics of Vairájás or Svayambhuvas given to them. I omit giving the other accounts relating to the creation in this Purána, as they coincide in almost every particular, except in the gradation of persons, with the account given by Manu.

The third chapter of the Śrīṣṭi Khaṇḍa of the Padma Purána also corroborates the account given in the Matsya Purána, with regard to the identity of Viráj with Svayambhuva Manu springing from Brahmá, and taking Satarúpá to wife. Thus Brahmá then produced from his essence Svayambhuva Manu identical with himself, who became king for the preservation of the universe, and begot a sinless girl named Satarúpá, whom Svayambhuva took as his wife." In this Purána Brahmá himself is said to have produced the other Manus, *viz.*, Brigu, Pulastya, Pulaha, &c., and not through Svayambhuva Manu as stated in the Institutes or the Matsya Purána. But there is no mention here by whom he begot them. It mentions, however, of Brahmá's creation of another supernatural being before that of the Manus, who was called Rudra, and who was as brilliant as the midday sun, and had a formidable and bulky body, half male and half female. This person can be no other than Viráj, though he did not propagate the Manus as his race. Rudra is another name for Śiva, who is acknowledged by the Śivites as Viráj in the Rudrayāmala Tantra. In the Vishṇu Purána, Vishṇu is said to be the first *puruṣa* or spirit, who with association with *pradhána* matter, becomes male and female for the creation of the world in the egg. This Vishṇu, says Wilson, is the same as the Brahmá of Manu which can never be the fact, as it is the popular belief, supported by the best authorities that Vishṇu is identical with Viráj.

The great epic Mahábhárata presents us with two striking instances of the manifestations of *Viráj* and *Viśvarúpa* in the person of Kṛṣṇa, who had given himself out to be an incarnation of Náráyaṇa, Vishṇu, or Viráj. In chapter 130 of the Udyoga Parva, he is mentioned to have assumed the first form, in order to intimidate the haughty usurper Duryodhana, who had plotted to arrest his person. "Think not oh! foolish prince," said he, "that I am alone:—the Suns, furies, Vasus and Rishis all accompany me. Thus saying he laughed aloud when lo! unnumbered spirits like flashes of lightning issued forth from his refulgent body. Brahmá appeared as burning on his forehead, and the Rudras shone forth from within his breast.

On his right arm were seated the ruling divinities of the world, and his countenance exhibited the images of Agnis, Adityas, Vasus, Sádhyas, Indras, Ásvinas, Maruts, and Viśvedevás, or all orders of deities, with an innumerable train of Yakshas, Rákshasas, and Gandharvas. Arjuna, holding his bow and deadly darts, stood on his right hand, and Baladeva with his plough on his left. The sons of Páṇḍu appeared seated on his back, and his front showed the mighty warriors of the Vrishpi and Andhara races. In his palm he held the discus, club, śakti, and other weapons. When behold! sparks of living fire, mixed with fume and smoke fled on all sides from his nostrils, ears, eyeballs, and the pores of his body. The assembly of mighty monarchs closed their eyes from fear, at the sight of the terrific cosmoform of Kṛishṇa. All were seized with fear save the sages, Rishis, Bhíshma, Droṇa, and Sanjaya, who remained fearless because of their faith in the godhead of Kṛishṇa, who had favoured them with clairvoyance [divya-chakshu].”

So in the Bhagavad-Gita—

“The mighty compound and divine being Hari, having, O Rájá, thus spoken, made evident unto Arjuna his supreme and heavenly form; of many a mouth and eye; many a wondrous sight; many a heavenly ornament; many an up-raised weapon; adorned with celestial robes and chaplets; anointed with heavenly essence; covered with every marvellous thing; the eternal God whose countenance is turned on every side! The glory and amazing splendour of this mighty being may be likened to the sun rising at once into the heavens, with a thousand times more than usual brightness. The son of Páṇḍu then beheld within the body of the God of Gods, standing together, the whole universe divided forth into its vast variety. He was overwhelmed with wonder, and every hair was raised on end. He bowed down his head before the God, and thus addressed him with joined hands.”

Another part of this epic presents us with the macrocosm or Viśvarúpa of Kṛishṇa before the assembled deities and monarchs, in the Sabhá Parva on the occasion of the Rájásúya ceremony of the coronation of Yudishtira. In Wilson's *Religious Sects of the Hindus*, page 30, I find Viráj as a name of one of the six qualities of the subtle form of Vishṇu or Kṛishṇa, and meaning absence of human passions synonymous with Virága. Instances like this, however, can be multiplied to any amount in proof of the identity of Viráj with Kṛishṇa and Vishṇu, but I think those already deduced are sufficient for the purpose.

In the Gaṇeśa Purána, Viráj is represented as incarnate in the form of Gaṇeśa, the god of the elephant head, for the purpose of destroying a certain demon. In chapter 62, called the Viráj-darsana, the following description of Gaṇeśa's person as Viráj is given.—“As the demon was thus

pondering in himself, he beheld before him the form of Viráj, touching the sky with his head, his feet rooted in Tartarus, his ear-holes containing the cardinal points, and huge forests forming the hairs on his body. The orbits of heavenly bodies appeared as circles on his person, and the wide seas looked as drops of sweat on his body, millions and millions of deities sporting on the tips of his fingers and nails, and the fourteen spheres of planetary bodies in the universe revolving in his belly. This being then snatched the demon and killed him in a trice, as children do bugs with their nails."

The Vishṇu Purāṇa, which is devoted to Vishṇu, represents that god as Viráj in the incarnations of Kṛishṇa and Baladeva. It says that the gods being persecuted by the demon Kaṇsa complained to Vishṇu of their grievances, who, in reply, told them that he will undertake to quell the arch-fiend by assuming his form of Viráj in his incarnation of Kṛishṇa at Vrindāvana, and forthwith showed his *Viráṭrūpa*, which the gods hallowed and adored.

Now as regards his consort Satarúpā, [centiforma] the female personification of material force [śakti], as Viráj is the male prosopopœa of spiritual energy, I have to mention that the words hundred and thousand in the appellations of both are mere metonymies of determinate numbers for indeterminate ones by figure of speech, as both spirit as well as matter can assume an infinity of shapes and forms. This female, in the various authorities quoted above, is sometimes made to represent the wife of Brahmá, at other times of Viráj and lastly of Svayambhuva Manu. But Moore, in his Hindu Pantheon, takes her for the wife of Viráj purusha only, and says, on the authority of Colebrooke, that the notion of Viráj dividing himself into male and female forms occurs almost in every Purāṇa, and the colossal figure in the cave of Elephanta bears relation to this division and re-union of Viráj. The partition of the body into male and female halves may very likely lead us to suppose this person to be Brahmá whom Manu has represented to be divided into two epicine halves, as also Svayambhūva Manu, the first man or Adam of the Hindus, whose left half, [rib or side] gave birth to the mother of mankind. But we know for certain on the authority of Manu that Viráj was not the same with his progenitor Brahmá, nor identical with his progeny Svayambhuva, whom "Dará Shikoh" says Sir William Jones, was persuaded to believe, and not without sound reason, to be no other person than the progenitor of mankind, to whom the Jews, Christians, and Muhammedans unite in giving the name of Adam. Therefore Satarúpā, who is designated by the special title of Rajdáríká or wife of Viráj, in the Rudra Yámala Tantra, could not be the consort either of Brahmá or Svayambhuva, as represented in the confused accounts given of her in the different Purāṇas, the inconsistencies of which are so apparent,

and the absurdity of identifying a god with a man so evident, as not to require an explanation.

The perfect coincidence of the description of Rajdáríká with that of her husband confirms the belief of her being a co-partner of Viráj only, as will plainly appear from the following extract :

“ She had millions of Vishṇus on her right arm, and a million of Brahmás on her left ; a million of Sivas on her head, and as many Indras at her feet. Millions of moons shone in her nails, and as many suns in her eye-balls. Her worshippers addressed her saying “ Save us, Oh ! thou source of the world and consort of Viráj, that givest birth to millions of Brahmás, Vishṇus, and Sivas, in thy hollow bowels.”

The difference of sex in the Hindu deities is assigned to the same reason, which Proclus mentions concerning the Greek and Roman divinities, in Timæus, p. 290. “ The division of male and female comprehends in itself all the plenitudes of divine orders ; since the cause of all staple power and identity, and the leader (χόρηγος) of being, and that which invests all things with the first principles of conversion, is comprehended in the masculine order. But that which generates from itself all various progressions and partitions, measures of life, and prolific powers, is contained in the female division.” Here we see all the gods from the supreme being downwards not only having a female energy but inseparably joined with it, as in the person of Adonis in the Orphic hymns.

Mention of Virát-kshetra, the site of Viráj's nativity, the scene of his incarnation, and the field of his exploits is often made in some of the Puráṇas. The Adhyátma Rámáyana describes the sanctity of the place in chapter 84, which has been noticed by Dr. Aufrecht under No. 74 of his Catalogus Codicum Sanscriticorum. The Bráhma Puráṇa mentions it to be situated at the confluence of eight streams, as Aufrecht says in p. 19 of the said Catalogue “ ad Virája regionem, prope octo fluminum confluentem sitam, proficiscitur.” In the Káka-rudra-samváda, it is mentioned as contiguous to Chola, Videha, Kerala, &c., and to be under the constellation Sagittarius, with Káñchí, Karnáta, &c. The Virát-bhúmi, or land of Viráj, is famed in the Puráṇas for its production of diamonds which are thence called Virátajas, and which justifies the supposition of its being situated near Golconda, celebrated also for its diamond mines. The place in the modern Geography of India is Berar, in the Deccan, and is called Berár, Borar, and Borád, by the natives, and there is évery reason to suppose this district to be the birth-place of Viráj, and more so, from the indisputable fact of the origination of all the early incarnations of Vishṇu having taken place in the Deccan, then known as the land of demons. The Virát-bhumi is also called the Matsya-desa, or fish country, in the Mahá-bhárata, an appellation which the inhabitants of Bagurá (Bogra), a district

in the north of Bengal, claim for this tract of land, because its streams teem with fish.

The accounts of the origin of the world, with those of its creative agencies, and created bodies given both by Manu and Moses, are mere allegories of the natural order of things, which require some explanation. In the chaotic state of things there existed only the eternal and infinite soul of god [Brahm] filling all the '*tohú wa-bohú*', the null and void, and over-spreading the whole with the immoveable, inactive, and all-pervading essence of his inscrutable nature, his entity and intellect the source of power. For knowledge, says the father of modern philosophy, is power, and infinite knowledge therefore must be the fountain of infinite power. He, wishing to create the world, first created the air, represented as the first development of the all-encompassing soul in the form of the spirit, the main source of motion and force, to give mobility to inert substance. To this followed the production of water, the atomic principles of which are conceived in the bosom of ether, which being agitated by the force of air or spirit of "*Náráyana*," conceived the latent heat, represented as *Brahmá* or god of fire within its bosom. This heat in its turn gave birth to *Vaiśvānara* the vivifying fire. And lastly the combination of the triple principles of the spirit, gave birth to the mundane egg, or rotundity of the material world, which came next to be manifested in its present form which we call *Viráj*. How far these theories of the Ancient Hindus are correct according to the light of physical science and modern experimental philosophy I am unable to decide, but I am confident that some of them agree with the theories of the Grecian philosophers on the origin of the world. Thales, for instance, regarded water or fluid substance as the single original element from which everything came and with which everything returned. Anaximenes derived the origin of all material things from a single element, and according to his theory air was the source of life. Heraclitus of Ephesus regarded fire as heat as the primary form of all matter, and Anaxagoras of Clazomenæ, conceived a supreme mind or intelligence (*νοῦς*) distinct from the visible world, to have imparted form and order to the chaos of nature.

The Vedánta holds *Viráj* to be the result of *Pañchīkaraṇa* or assemblage of the five elements, which for the sake of brevity I will quote from Ward's translation of the Vedánta Sāra, Vol. I, p. 371.

"From the five subtile elements proceeded the subtile bodies. From these five subtile elements in proportions of five, arose the masses of solid matter; but each is distinguished by the name of the element which is most prevalent. In the solid mass of ether sound is found; in air is found both sound and touch; in fire sound, touch and form; in water, sound, touch, form, and taste; in earth, these four and smell. The qualities are

partly natural and partly artificial. The active principle dwelling in the collected sum of solid matter is called *Vaisvánara*, or he who is conscious of self-existence, and *Virát* as he is held forth, or displayed in all creatures."

But as the being under investigation is to be considered more properly as an intellectual and spiritual person or the sensible emblem of an ideal being, rather than any real personage of history, his nature and character are to be sought for more in works of philosophy, theology and divinity, than in any other, and we must therefore explore the Vedánta, the only metaphysical and theological school of the Hindus, for a true account of this supernatural being. It conceives three orders of incorporeal natures in the chain of beings from the supreme to the human soul. The first consisting of pure intelligence (*chit*) composed of the causal principles of nature called *Kāraṇa Saríras*. The second of intellectual beings [*cheta-nas*] composed of subtile spiritual bodies called *Sūkshma* or *linga Saríras*. And the third comprised of intelligent beings [*chaitanyas*] joined with concrete, gross or material bodies called *Sthúla Saríras*, in which *Virát* the god manifest in nature is included. Another definition of the demiurgic triads will have the last to be the product or *Kárya Saríra*; the second, that by which it is produced, *linga saríra*; and the first, that from which the thing produced, takes its pattern, *i. e.* the *Kāraṇa Saríra*, depicting them under the analogy of the archetype, architect, and the offspring, in which last position *Viráj* is taken to stand, who therefore is understood to participate of the entity and omnipresence [the chief attributes of the eternal and infinite soul] as far as he extends throughout the duration and bounds of nature.

To give a description of the theogony of *Viráj*, among the other persons of the triads, or, in other words, to show the distinction of that state of the divine soul from the other conditions, and the relation it bears to them in the order of succession, would require an exposition of the whole theodecy of the Vedánta system, which would be out of place here. I shall therefore content myself with giving a short account of these different degrees of divine personages, or rather the several denominations of these spiritual and psychological beings, in order to show the relation they bear to *Viráj* according to what I could gather about them, from the translation of the Vedánta Sára by Ward, Colebrooke's Essay on the Vedánta, and Röer's translation of the Upanishads.

The first order composed of pure intelligence (*chit*) and possessed of causal form (*Kāraṇa Saríra*) and having the quality of purity or goodness only (*Satva*), is comprised of three persons according to the general or particular modifications of these properties, styled totality (*Samashṭi*), and speciality or individuality (*vyashṭi*), in Vedánta terminology, *viz.* :—

1st.—*Brahm*, omnipresence or the unlimited essence of god in duration and space ; called also *turiya* or quadruple, for its being the receptacle of the three orders and human soul (*jīva*).

2nd.—*Prajñā*, omniscience, *i. e.* intellect or understanding devoid of action, whence it is termed inert (*niskriya*).

3rd.—*Īśvara*, omnipotence, the active principle, or creative agency and causality of god.

The second order composed of intellectual beings (*Chetanas*) possessed of subtle spiritual bodies (*sūkshma linga śarīra*) and having the quality of passion or affection (*rajas*), comprises the three persons of

1st.—*Sūtrātmā*, the undivided spirit or connecting soul of all subtle bodies, as Pope expresses it ; “Diffused through all, yet in all the same.”

2nd.—*Hiranya-garbha* or *Brahmā*, the creator of the Universal frame.

3rd.—*Taijasha*, the spirit united with the mind in intellection.

The third order composed of intelligent beings (*Sthūla Śarīras*) possessed of concrete and gross bodies, and having the quality of foulness (*tamas*) is also comprised of three persons, according to the universality or individuality, manifestation or reticence.

1st.—*Vaiśvānara*, the universal soul latent in all bodies, as their prime automaton or moving principle and allied to material force.

2nd.—*Virāj*, the mundane soul obvious in nature as her formal cause.

3rd.—*Viśva*, the individual soul abiding in every gross body.

And lastly *Jīva*, the human soul endued with life and sensation.

Ward, in his translation of the Vedānta Sāra, gives the following descriptions of these persons in the Godhead belonging to the threefold triads of the Deity :

“The active principle dwelling in the collected sum of solid matter is called wishvānara or, he who is conscious of self-existence, and Virāt, as he is held forth or displayed in all creatures, &c.”

Colebrooke, in speaking of them, begins with the last [*Jīvātmā*], and says, “The soul [as a portion of the divinity] is infinite, intelligent, sentient, and true. It is made to act by the supreme Being, but in conformity to its previous resolutions : and those again have been produced by a chain of causes extending backward apparently to infinity.” [*Vide Transactions of the Royal Asiatic Society*, Vol. II, p. 22.]

Dr. Rōer, in the introduction to his translation of the Taittirīya Upanishad, gives the following compendious sketch from the Vedānta Sāra.

“The cause of the world, according to Vedānta, the source of all reality, and strictly speaking of all reality itself, is *Brahm*, the supreme soul or spirit.” “It consists of the three qualities of *salva*, *rajas*, *tamas*, which denote the three degrees of its existence, or of its power of manifestation, &c.” “God in his relation to the totality of ignorance is omnis-

cient, omnipotent, &c., that is, he has all the attributes of the Creator and ruler of the world, and is called in this respect *Iśvara* [the ruler]". "God in his relation to special ignorance is the individual soul, the defective intelligence *Prajñā*." "Here again, the subtle body is either a totality or an individuality. The soul or god as pervading the totality, is called the *Sūtrātmā* or *Hiranyagarbha*, as pervading an individuality, and *Taijasha* [the resplendent]. Both, however, are in reality one." Again, "From the subtle elements further proceed the gross elements, and from the gross elements the different worlds and different bodies &c." "The soul as abiding in the totality of gross bodies is called *Vaiśvánara*, *Virāt*, &c., as abiding in an individual body *Viśva*." The definitions of some of these modes of the divine soul are differently given in different works, as for instance the *Māṇḍukya Upanishad* describes *Prājñā* as omniscience instead of ignorance, as stated in the *Vedānta Sāra*. Thus, "His third condition is *Prajñā* [who completely knows] who has become one, whose knowledge is uniform alone, whose nature is bliss, &c." "He [the *Prājñā*] is lord of all: he is omniscient, he is the internal ruler, &c.," [*vide idem*, verses 5 and 6].

These quadruple conditions of divine spirit are incased in four different sheaths of the soul, which I give here in the words of Dr. Rōer.

1st. "The intellect with the internal organs forms the intellectual sheath. 2nd. Mind, with the organs of action, the mental sheath. 3rd. The vital airs, together with the organs of action, for the vital sheath. 4th. The three sheaths when united are the subtle body of the soul &c." "The gross body is called the nutrimentitious sheath (*Annamaya Kosha*), and as it is the place where gross objects are enjoyed, it is called awake." All these four conditions of the soul are perceptible in four different states of human life, namely, the intellectual, in deep sleep, when the intellects are awake, notwithstanding the dormancy of the other faculties; the mental, in the dreaming state, when the mind acts in absence of bodily functions; the concrete, consisting of *Vaiśvánara*, *Virāj* and *Viśva*, in the waking state, when we perceive all sensible objects by means of external organs.

"The totality of the gross, the subtle and the causal bodies, forms one great world, and the soul from the pervader to the ruler is one soul." Hence these triple orders of intelligences, are of the same essence, inasmuch as they are all intellects, admitting only of the difference in point of boundlessness and limitation, otherwise called universality and individuality. They are modifications of the selfsame spirit of god and are equally objects of worship, and that of *Virāj* is the most important as the most conspicuous among them. Meditation of these modes of *Brahma's* existence is said to be the most rational and profound worship of god, and it is necessary to commence with the mode or state in which reflection first rises, and is concluded with the last result to which that reflection has attained.

It may perhaps not be irrelevant here to trace some analogies of the incorporeal natures treated herein, with those met with in European philosophy, although I am far from maintaining that they bear any exact similitude to each other. I find Virájism bears a great resemblance to Stahl's doctrine of Animeism, whose automaton or moving force of the world corresponds exactly with Vaisvánara, the other name of Viráj, and answers to one of the demiurgoi of Plato, called nature by Lampsacus and the Stoics and Plastic nature by Dr. Cudworth. Viráj agrees in some respects with the Archæus of Paracelsus, and the Principium Hylarchicum of Henry Moore.

Some are apt to consider these theories, as also Virájism, to be allied to Pantheism, while on the other hand it can plainly be seen, that though the spirit of god is apparent to all as working in the universe, it is essentially separate from it, having had a separate personal existence before it was brought into being, and continuing to have a separate personal existence simultaneously with it. The words of St. Augustine "in illo sunt omnia," could not be construed in a Pantheistic sense, nor could that which Lucan says, "Jupiter est quocunque vides, quocunque moveris," be taken in that sense. The angel in Genesis [xvi, 7-13] is called 'El roi,' 'God of sight,' or God manifest, and the word Immanuel, God with us, plainly refers to the manifestation of Viráj. The mystic doctrine of the Persian Súfis alludes to the manifestation of divine essence in the whole creation in the words "there is no real entity besides that of god."

The universality and individuality of the divine spirit, of which it is difficult to derive an idea from their definitions in the Vedánta, appear much to resemble the generality or particularity of the psychic fluid, which according to the doctrine of Quesne is said to be diffused alike through all nature, but differently exhibited according to the particular organisations of minds and bodies. The Hindu Theism, like every other system of Unitarianism, inculcates the unity, soleity, and monadity of the divinity, as it is well known by its maxim "Ekamevadvitíyam," agreeing with the *μόνος θεός* of the Christians and the *hwa wáhid* of the Muhammadans, but at the same time it speaks of the persons of the Trinity, only as so many manifestations and denominations of the same being, according to the distinctions of mere modes as maintained by Modalists, and illustrated by them by analogies drawn from nature, as the following: "Speciem ignis, splendorem et calorem; splendor ab igne nascitur, calor ab igne et splendore generatur. Splendor est de igne, et tamen sunt cœva. Sic tria in sole occurrent; ipsa solis substantia, radius et lumen, et tamen in his tribus est eadem lux: ut radius de sole nascitur, sic Filius de patre generatur, calor ab utroque progreditur, sic spiritus ab utroque spiratur." To each of these persons they ascribe a "character, *ὑπόστασις*, hypostasis," *i. e.* "Complexus notarum quibus personæ

divinæ inter se differunt," and take into consideration the internal and external relations which they bear to each other.

The nearest affinity which the Vedánta theology bears to any other, is that of Plato, where we have the same number of the orders of Demiurgic principles in the Jovial, Adonical, Dionysiacal trinities [*Δίος, Διονυσιακή, Ἀδωναική*], from which many grades and degrees of gods are said to proceed, as the intellectual, supermundane, mundane, &c., but how far they agree with the Vedántic orders is a question which cannot be discussed here.

Before taking leave of my subject, I will add a few words in anticipation of the charge of Pantheism, which Virájism may otherwise incur from the ubiquity, universal pervasion, and similar attributes of the god. It must be borne in mind that Viráj fills the universe in spirit, while Pan the god of Pantheism is represented as filling it in substance, as Dr. Jardine says in his tract on Theism. "There are those who identify god with the universe, believing that he is immanent in all things, that he is the substance or inherent force which shines forth in the sun, organises the various forces of nature, lives in the animal and vegetable kingdom, and thinks in the human mind. This is usually known by the name of Pantheism." The Orphic hymn quoted below describes Pan, as materially and substantially diffused in nature like *Viśvarūpa* and not in spirit as Viráj.

"I call strong Pan, the substance of the whole,  
 Etherial, marine, earthly, the total whole,  
 Immortal fire ; for all the world is thine  
 And all are but parts of thee, O power divine !"

In a fragment of Epictetus, we find Chrysippus referring everything to Jupiter, and maintaining a rigid Pantheism in these words, that—"The world is, as it were, an animated body, and that god is the governing power, and the soul of the whole." And that "the world is one of the intelligent principles, governing in common with gods and men." Diogenes the Babylonian, in his book concerning Minerva, asserts that, "the world is the same as Jove and comprehends the divinity." Among the followers of Zeno, many assert this Pantheism, by saying "God is one, the universe and its soul."

The notion of the spiritual diffusion of Viráj throughout the whole expanse of nature occurs in the Orphic hymn to Protopogonus, the firstborn Aeon, but nothing can be better descriptive of his nature and attributes, than what is given in Pope's Essay on Man, IX.

"All are but parts of one stupendous whole,  
 Whose body nature is and god the soul."

And in Thomson's hymn at the end of his "Seasons."

"These as they change, Almighty Father, these  
 Are but the varied God, &c., &c."

*Note on a Copper-plate Grant found in the Record Office of the Cuttack Collectorate.*—By BĀBU RANGALĀLA BANERJEA, Deputy Collector, Cuttack.

(With a plate.)

This document was found by me in an old box in the Record Office whilst engaged in drawing up a report on the condition of the records. The box contained a number of old deeds of grants in the Devanāgarī, Persian, Bengali, Marhattī and Uriyā characters; these were the remnants of a vast variety of such documents, said to have been filed by the original holders, before the Collector Mr. Kerr in 1810, when the province was settled for the first time. Up to this day applications are filed before the Collector, for a copy, or for the original, of one or other of these documents. Unfortunately no proper register has been kept with reference to these important records, and there is nothing to shew by whom the plates were filed before the Revenue authorities. The deed is inscribed on three oblong plates of copper, each measuring 8" × 6½". The first plate has the inscription on one side only; the second, on both sides; and the third on the upper half of the inner side. The three were originally held together by a ring, for which the plates were pierced, the hole being eight-tenths of an inch in diameter. The ring is lost. The writing is in an antique form of the Kuṭila character.

The record commences with some very prurient poetry, describing the personal charms and Arcadian loves of the nymphs of Kaṭaka, the numerousness of its majestic elephants, the shining whiteness of whose tusks overshadowed the bright autumnal moon, and the freshness and coolness of the gelid breezes which stirred the waves of the Mahānadī, and allayed the langour of its love-sick maidens.

After this exordium the record goes on to state that in the glorious city on the banks of the Mahānadī, there lived a king named Janamejaya, and from him came a lord of men called Yajāti, whose fame had spread over the three regions of the universe, and whose prowess had, without any exertion, subdued his enemies. This panegyric is immediately followed by the well-known royal titles of the Gupta dynasty, adding the word "Trikalīṅgādhipati" (त्रिकलिङ्गाधिपति), or "the lord of the three Kālīṅgas"; the name of Bhava Gupta and that of his successor, literally "the adorer of his feet", Śiva Gupta are then introduced, and after them follows the mandate of the latter to his courtiers, officers and other subjects to this effect, that he,

Sīva Gupta (not Yajāti) gives the village of Chandra in the Bisaya or fiscal division of Maraḍa in the province of Dakṣhiṇa Kośala, to one Gaṅga-pāni, the son of Divākara and grandson of Ananta Bhaṭṭa, a Brāhman of the Bhāradvāja clan, for so long as the sun, moon and stars would continue to shine in the firmament. The edict then enumerates a number of Śāstric quotations, as usual in such records, cursing the robbers of land given in gift, extolling those who preserve and protect such gifts, and expatiating on the shortness of human life, which is said to be as unstable as a drop of water on the slippery surface of a lotus leaf. The concluding verses are an eulogy on Champati Chhinchāṭa of the minister of war and peace of Yajāti, (not of Sīva Gupta), and then comes the date of the plate and the name of the engraver Mādhava. The date is the 9th of the waxing moon in Jyeshṭha, on the ninth year or Saṁvatsara of the reign of Yajāti.

The discovery and decipherment of this plate, establish two hypothetical points advanced by me in my paper on the Chaudwār plate, namely : 1st, that Orissa, or a part of it, was, during the Gupta rule, called after their mother-country "Kośala," and 2nd, that the Keśaris of Orissa acknowledged the Guptas as the Paramount Power.

In support of the first of these two points, we have in unmistakable terms the names of Dakṣhiṇa Kośalā or South Kośalā followed by that of the fiscal division of Maraḍa, and the name of the village Chandra. The last two names still exist in the district of Kaṭaka : the parganā of Hariharpur is up to this day called in common parlance Maraḍa Hariharpur, and there still exists in that parganā a village called Chandrá. The latter is written with a final long á, whereas that of the plate is a short one, but the difference is so slight, and such phonetic changes are so very common in Indian names, that it scarcely deserves a comment here. The village is still a Brāhman village of note.

As to the subordinate position of the Keśaris, the indication in the plate is plain enough. The gift is made in the name of the Guptas with the imperial and dignified designation of *Mahārājādhirāja*, while Yajāti is simply called *Mahārājā*, and his ancestor Janamejaya, a *rājā* only. The Śāstras very distinctly enjoin that it is the sovereign only who has the power of giving land in perpetuity, even Sāmantas or tributary kings, when making such gifts, must take the permission of the Paramount Power. The quotations above referred to prove this beyond a question ; these mention the names of Sagara and Rāma, the emperors of India, as the givers of land. This law has much relaxed in the present iron-age, despite the injunctions of the Smṛitis.

A new link in the royal lineages of Orissa is gained by the reading of this monument, and of another which was found under ground in a place called Puran, in Parganā Sybir. According to the Mādhlápānji and the

Vaṇśávalis, Indra Deva or Chandra Deva reigned in Orissa in 323 or 328, A. D. Two or three years before these dates, Orissa was occupied by the Yavanas, who held it for 146 years, after which Yajáti Keśarí expelled them, and founded the Keśarí or lion dynasty. This prince was said to have reigned 52 years, and he it was who brought back the image of Jaganátha to Puri, and laid the foundation of the temple-city at Bhuvaneśvara. Now, both these records are silent as to the parentage of Yajáti; but here the plates give it in plain terms, stating that Janamejaya was his ancestor, and he (Janamejaya) reigned on the banks of the Mahánadí, *i. e.* in Kaṭak Chaudwár. This is very probable, as the royal family was expelled from Puri by the Yavanas, who are said to have come in ships and landed near the sacred city. The astrologers of Orissa say that Chaudwár was founded by Janamejaya the great-grandson of Arjuna one of the heroes of the Mahábhárata; but this is evidently a confounding of names, for the plates simply say—

“ राजा बभूव भुवि भावितभयमूर्तिः ।

श्रीमान् सरोजवदनो जनमेजयाख्यः ॥”

“There was a king of gentle mien named Janamejaya the lotus-faced.” It does not describe him to be the extirpator of the Nága race, the son of Parikshita, and the lord paramount of all India reigning in Indraprastha or Delhi. The plates simply call him a rájá, having his chief city on the banks of the Mahánadí.

If these surmises be accepted as correct, we have here then the approximate date as to the time when Chaudwár was founded, namely, the earlier part of the first century of the Christian era, for traditionally Janamejaya was its founder; and he must have been some adventurer from the north-west; the Vaṇśávalis are silent as to the father of Haṭakeśvar Deva, the sixth prince in ascent from Yajáti, and presumably Janamejaya must have been his progenitor, for in the Puran plate, we find Bhima Deva was also born in the race of Janamejaya, and this prince reigned in 282—319, A. D. The following is his lineage:

A. D.

143—194 Haṭakeśvara Deva : reigned 51 years.

194—237 Birabhuvan or Tribhuvan Deva : reigned 43 years.

237—282 Nirmala Deva : reigned 45 years.

282—319 Bhima Deva : reigned 37 years.

It is almost superfluous to add here, that *the* Janamejaya of our plates, is not the Janamejaya Keśarí of the Vaṇśávalis: the latter reigned between the years 754—763 A. D., about 250 years after Yajáti.

Another noticeable fact regarding the endowment mentioned in this deed, is the probability of such grants having been made by the person

under notice, for, according to the palm-leaf records, this prince was celebrated for his piety and his munificence to Bráhmans, for he it was who rescued his native land from the hands of a foreign foe, restored the worship of Jagannátha at Puri, and commenced to build the sacred fane for the worship of Mahádeva in Bhuvaneśvara.

As regards the names of places in this plate: at the commencement of the declaration, the endower says that the village of Chandra, in the fiscal division (*Viśaya*), of Marāḍa, in the country (*Deśa*) of Dakṣhiṇa Kośala, is given in perpetuity; but with regard to the grantee, the declaration specifies that he was a Madhyadeśiya Bráhmaṇ, who came originally from the village of Śrīvalla, and was residing at Silabhanjapati, a village in the country of Odra (Orissa). Now the question arises, if the country at the time bore the name of Dakṣhiṇa Kośala, which included the fiscal division of Marāḍa, and a village called Chandra; what was the site of Odra whose name occurs separately, as distinct from Dakṣhiṇa Kośala? If we recall to mind, however, that the Odra of old was not coterminous with the Orissa of modern days, including the three districts of Katak, Puri, and Balasor, the difficulty disappears. Odra originally comprised very little, if any, besides the present subdivision of Khurdá. It was the original country of the Oḍ Chásás, and the name Odra was subsequently assigned to the whole tract from the Chilká Lake to the Vaitaraní River, and included the names of Kaliṅga, Kośalá, and Tilkala. We have its parallel in Bengal. Different portions of that province at one time bore the names of Puṇḍravardhana, Gauḍa, Barendra, Tamralipta, &c., which all gradually gave place to the single designation of Banga, though the latter was but a small portion of the main country in the delta of the Ganges.

The original country of the Bráhmaṇ who had the endowment from the royal hands of Yajáti Keśarí, calls for a few remarks. Dr. Hunter, speaking of the Bráhmaṇ migrations in Orissa, says: "The local legends and the palm-leaf records alike relate how about 500 A. D. the founder\* of the long-haired or lion line imported ten thousand Bráhmans from Audh and endowed them with lands around Jájpur on the sacred Baitarini river." But the record under notice and the Chaudwár one (which is evidently a very old grant) prove beyond a question, that the North-western Bráhmans must have migrated to Orissa long before Yajáti Keśarí, for the plates give the names of three generations of the grantees, the names of their original and adopted countries and villages, &c. This record shows moreover, that the migration was not restricted to Audh Bráhmans only. In this case, the grantee belonged to Madhyadeśa, which, according to Manu, is the country between the Himálaya and the Vindhyan chain, bound-

\* Yajáti Keśarí.

ed on the east by Prayāga (Alláhábád) and on the west by Vinasana (Kurukshetra).\*

The site of Srívalla or Valla must be searched for in the North-West for identification, while Śilabhanjapati occurs somewhere in Khurdá. Again, the Bráhmaṇs not only formed colonies round Jájpur, but had villages given them near Katak Chaudwár in Māraḍa Hariharpur, in the subdivision of Khurdá, during the reigns of the founder of the Keśarī dynasty and his predecessors. There is every probability, however, of the Keśarīs, who originated and sustained the revival of Bráhmaṇism in Orissa, having invited Bráhmaṇs from the North-West, even as their successors the Gaṅgāvañśīs brought them from the South; these two distinct streams of migration of the Bráhmaṇs are now blended together, unlike the Kányakubja and Vaidika Bráhmaṇs of Bengal, who never intermarry nor eat with each other.

The record is full of orthographical mistakes, but I thought it tedious to note them in detail; the reader will find them by comparing my reading with corrections with the facsimile of the plate. A few of the corrections have been shown in parenthesis.

#### TRANSCRIPT.

ॐ खल्लि प्रेमनिबद्धमुग्धमनसोः स्फारीभवच्चतुषोर्धूनोर्धे-  
च विचित्रनिर्भरतरङ्गीडाक्रमं तन्वतोः । विच्छिन्नोऽपि हतानिमाचपुलकै-  
राविर्भवत्पीतितैरास्त्रैर्धृष्टपितृकृतैः स्मररसः कामं मुञ्चः स्थाप्य-  
ते ॥ यत्राशेषविशेषरूपमहिमा यास्त्वय्युरःकान्तिभिर्ज्जातेर्षकल-  
हेष्वपि प्रणयिनः कर्षोत्पल्लेखाडिताः । जायन्ते प्रविशङ्कितस्मरस्मर-  
प्रोत्सापितान्तर्धया(थाः) सान्द्रसेदजलावसेचनवशाग्निर्धातरामाङ्कुरा-  
ः । १ ॥ अत्युत्तङ्गकरीन्द्रदन्तमुसलैः प्रोक्तासिरोचिचयेर्षा-  
न्तध्वंसननिष्कलीकृतस्मरचन्द्रोदयैः सर्वदा । यत्रासीदसतो  
जनस्य विशदं मुक्तामयं मण्डनं सङ्केतास्यदमयतीव धवलं  
प्रासादशृङ्गापतः । १ ॥ मञ्जानदीतुङ्गतरेङ्गभङ्गस्फारोत्स (च)  
लक्ष्मीकरवह्निरारात् । यस्मिन् रतासक्तिमदङ्गनानां अमापनो-  
दः क्षियते मरुद्भिः । १ ॥ तस्मात् श्रीविनीतपुरात् । लोकत्रयप्र-  
थितशुभयशोचितानव्याप्ताष्टदिकप्रसमनिर्जितवैरिदग्धैः ।  
राजा बभूव भुवि भावितभयभूतिः श्रीमान् सरोजवदमो ज-  
गन्मेजयास्तः । ४ ॥ यः शृङ्गापविदारितद्विपवटः कुम्भस्थ-  
लादुल्लसन्मुक्ताजालविभूषितं प्रतिरणं शृङ्गीवधूरःस्थलं । च-

\* “ चिन्मात्रिविन्ध्ययोर्मध्यं यत् प्राग्निनशनादपि ।  
प्रत्यगेव प्रयागाच्च मध्यदेशः प्रकीर्तितः ॥”

जे आदतरामराधिपतिरेरजापजाहामला यथासम्बुजर-  
 कवः समतया तद्रश्मिलक्ष्मीवधूः । ५ ॥ निर्धारितारिकरिक्कुभस-  
 मुद्रमृत्तुफलप्रकरयुक्तनखाप्रधारः । तस्मादजायतजग-  
 त्तथगीतकीर्तिर्हेहाविनिर्जितरिपुर्नृपतिर्येजातिः । ६ ॥ पर-  
 ममाहेसरपरमभहारकमचाराजाधिराजपरमेश्वर-  
 सोमकुलतिलकचिकित्साधिपतित्रीमहाभवगुप्तराज-  
 देवपादानुध्यातपरममाहेसरपरमभहारकमचारा-  
 जाधिराजपरमेश्वरसोमकुलतिलकचिकित्साधिपतित्रीम-  
 हाशिवगुप्तेवः कुम्भक्षी ॥ दक्षिणकोशलाया मरुदविषधी-  
 यचान्द्रपाने । तद्विषधीयब्राह्मणानां पूज्ययथाकालाध्यासिनः  
 समाहृतसन्निवीतवर्षोहितसामवायिकनियुक्तकाधिकारिकदा-  
 ष्टप्राप्तिकपिशूनविधिकार(वेचिकाव)रोधजनराणकराजपुत्रराजवज्र-  
 भादीन् सर्वान् समाज्ञापयति विदितमलु भवतां यथाऽस्माभिर-  
 यं प्रातः सन्निधिः सोपनिधिः सर्वबाधाविवर्जितः सर्वपरि-  
 कराहानसहितस्त्रालादितवसंयुतः सगर्भोपरसजलस्थ-  
 लक्षतुःसीमावच्छिन्नः मध्यदेशीयश्रीवज्रप्राप्तविनिर्गताय  
 चोद्गदेशे श्रीशिलाभञ्जपाटीवास्तव्याय । उक्तापूर्वभार-  
 द्वाजगोत्राय । आहिरसवार्चस्त्यभारद्वाजप्रवराय — —  
 — कौचुमिशालाध्यायिने भद्रपूर्व्यानन्तनग्न(त्रे) श्रीगङ्गापाणीना  
 को दिवाकरपुत्राय । आजाह्वानेति यजुः पुरस्तात् सल्लिखारा-  
 पुरस्सरमाचन्द्रतारकाक्योतिः (चित्ति) समकालोपभोगार्थ-  
 म् मातापितरात्मनश्च पुण्यश्रेऽभिष्टये तावशासने-  
 माकरीकृत्य प्रतिपादितं इत्यवगत्य यथास्मदीयक्षणकरभरहिर-  
 ण्यभोगभागादिक(क) ददद्भिः (भवद्भिः) सुखेन प्रतिवस्त्यमिति ।  
 भाषिभिश्च भूपतिभिर्दन्तिरियमस्मदीयधर्मगौरवादस्मद-  
 नुरोधात्खदन्तिरिवाच पास्तनीया । तथा चोक्तं धर्मशास्त्रे व-  
 उभिर्वसुधा दत्ता राजभिः सगरादिभिः । यस्य यस्य यदा भूमि-  
 लस्य तस्य तदा फलं । माभूदफलशङ्का वः परदत्तेति पार्थिवः ।  
 खदन्तात्फलमाजन्त्यं परदत्तान्पालने । आस्तोऽयन्ति पित-  
 रो वस्त्ययन्ति पितामहाः । भूमिदाता कुले जातः स नन्माता भविष्यति ॥  
 भूमिं यः प्रतिगृह्णाति यस्तु भूमिं प्रयच्छति । उभौ तौ पुण्यकर्माभौ  
 नियतं स्वर्गगमिनौ ॥ तडागानां सङ्ख्याणि वाजपेयशतानि च ।  
 गवां कोटिप्रदाने च भूमिहर्ता न श्रूयति ॥ हरते चारयेद्यस्तु सत्त-  
 द्दिल्लभोदतः । स बहो वाचसैः पार्थैस्त्रिर्यग्येभिः स गच्छति ॥ सु-  
 वर्णमेकं गमेकां भूमेरप्यर्धमकुलं । हरन्नरकमायाति  
 यावदाभूतसंश्रवं ॥ खदन्तात्परदत्ताम्वा यो हरेत वस्तुभरां ।  
 स विद्यायां क्षमिर्भूत्वा पिबतिः स च पश्यते ॥ आदित्यो वच-

लो विष्णुर्गङ्गा सोमो कृतार्जनः । द्रुक्षुपाक्षि भगवानभिनन्द-  
 नि सुमिदं ॥ सामान्योऽप्यन्तर्सेतुर्धृष्टपाणां काले काले पाल-  
 नीयो भवद्भिः । सर्वानेतान् भाविनः पार्थिवेन्द्रान् भूयो भूयो या-  
 चते रामभद्रः ॥ इति कमलदलान्मयिन्दुलोकां श्रियम-  
 नुचिन्त्य मनुष्यजीविनं च । सकलमिदमुदाहृतं च बुद्धा न हि पु-  
 रयैः परकीर्तयो विस्तोषाः ॥ अथा यत्तु गुणात्मनस्तूयैः \* ।  
 येनात्यन्तदुरासुराधिपगुरः प्रज्ञाभिमानैर्जितो राज्ञारोपितराज्यभा-  
 रममुलं यथावच्छलीलया । यस्यासीन्नयविक्रमहृद्यमपि प्रेयान्  
 सखा सर्वदा यः ख्यातो धृतसान्निविषश्चपदः श्रीहृष्टदेव्यमती ॥  
 परममाद्येश्वरपरमभङ्गात्मकमहाराजपरमेश्वरसोमकुलनि-  
 लकविकलिङ्गाधिपतिश्रीयजातिराजदेवप्रवर्द्धमानविजयराज्ये  
 नवमे सम्वत्सरे (संवत्सरे) ८ ज्येष्ठ श्रित चयोदश्यां १९ (०) अक्षीणं  
 विज्ञानी माधवेनेति । ॐ ॐ \*

## TRANSLATION.

Om, be it so !

Where wanton pleasure is enjoyed to perfection by young people in the play of love's charming sport, with eyes expanded and minds enamoured and centred in love, although the pleasure was at times disturbed by their embraces, which caused horripilation, inarticulate sounds of lips and exhaustion—

where lovers of exquisite beauty, desiring to pick a quarrel with their loved ones, mention the beauties of Apsaras and thereby excite their jealousy, and are beaten by the maidens with the lotus of their ears, suffer from excessive internal pain occasioned by the arrows of undaunted Cupid,—and have horripilation from the rising of the thick sweat—

where by the shining pestle-like tusks of tall elephants which have made the rising of the moon redundant in dispersing darkness—where the brilliant ornaments of pearl of immoral people and the place of assignation at the top of their house are made exceedingly white—

where the lofty waves of the Mahánadí break each other, and cause bubbles to rise, and the air, carrying the particles of water, refreshes the ladies who have zealously pursued the pastimes of love—

—even there, in that glorious city, there reigned once a king named Janamajaya, whose white canopy of fame had spread over the three worlds, and penetrated the eight quarters—who conquered all his enemies with

\* The last three feet of this stanza are missing.

force, who always meditated on the image of goddess Bhavya, was opulent, and prosperous, and whose face was as beautiful as the lotus.

He adorned in every battle the breast of the lady-like earth with pearls issuing from the foreheads of elephants torn asunder by him with his horn-weapon; the (white) dust raised by elephants in the sky and the stream of light of the adorned earth were as brilliant and beautiful as the jewels on the head of the king of gods, and appeared as the emblems of the glory of the king.

The king Yajāti was his son. His nails were always filled with heaps of pearls, when they were displaced by him from the foreheads of elephants which were like sealed caskets. He was praised by the three worlds, and he easily conquered his enemies.

Mahārājā Siva Gupta Deva the prosperous, the virtuous, the venerable king, the lord of the three Kaliṅgas, the chief of the lunar race, lord of all lords, the venerable, the ardent follower of Siva, and successor of Mahābhava Gupta Deva, lord of the three Kaliṅgas, chief of the Lunar race, lord of all lords, prosperous, venerable, an ardent follower of Siva—prosper.

It is proclaimed in the village of Chandra to all Brāhmaṇs of the district of Marāḍa in South Kośalā and to all others that have assembled here, namely, those who are worshipful, those who observe prescribed times for their sleep, who are invested with holy threads, who observe the rules of their respective castes, chiefs of corporations, superintendents of employés, yeomen, ambassadors, legislators, guards of female apartments, sons and beloved wives of kings, &c.;—be it known to all of you, that I give, with water in hand, this village with all its treasure-troves, deposits, free from all incumbrances, with all rents, all trees, such as palms and others, saline soil, land and water, bounded in four directions, to Gaṅgapāṇi, the son of Dīvākara and grandson of Ananta Bhaṭṭa, who has removed himself from the village Śrīvalla in the Madhya-deśa (the middle country) and now lives in Śīlabhanjapati in the country of Oḍra, who belongs to the well-known Bharadvāja family, and who is a descendant of the threefold clan, Aṅgīrasa, Vārhaspatya, and Bharadvāja, a reader of the Kauthumi branch of the Vedas, that he may enjoy it as long as the sun, the moon and the stars shine in the firmament, for the augmentation of virtue and extension of fame of my own and of my parents. This is engraved on this copper-plate. You all know this. Live with happiness, pay him as you used to pay me, the debts, the rents, taxes, gold and the royal shares in all usufructs. In compliance with our request and out of respect for us abstain from all violent deeds. Let all future kings preserve this our gift, as they would their own. For it is said in the holy writ: Lands have been given by many kings, such as Sāgara and others; to whomsoever the land belongs for the time being to him belongs the fruit of the gift.

Let him not doubt of the fruit, thinking that they were presented by others. The merit is greater in preserving other's gifts than in making one.

The manes of fathers and grandfathers of the donor of lands are proud of him ; they clap their arms and dance with joy, (exclaiming) " Such a son has been born in our family, and he will be the cause of our salvation."

He who receives lands and he who presents them, both are virtuous, and will ever remain in heaven.

The sin of the resumer of grants is not atoned for even by the exca-  
vation of a thousand tanks, the celebration of a hundred Vaja-peya sacrifices,  
and the gift of ten millions of cows. If any man, through intoxication or by  
mistake, takes or induces another to take with force any land which had  
been presented by any other person, he takes his birth among beasts and  
birds, and is tied with the noose of Varuṇa.

Should any man steal a single gold coin or resume land, even a square  
inch in area, he will dwell in hell until the dissolution of the world.

He who takes by force land which had been given by him or by any  
other person, becomes a worm in ordure, and rots there with his ancestors.

The sun, the moon, the god of water, the god the creator, the god the  
preserver, the destroyer and fire, praise the donor of lands.

" This common bridge of virtue ought to be preserved by you evermore" ;  
Rámabhadra repeatedly begs this of you.

It ought to be remembered that prosperity and life are as evanescent  
as a drop of water on a lotus leaf. And bearing this in mind let none destroy  
the glorious deeds of others.

S'ri Chhinchati of Champatī, the able statesman who excels the spiritual  
guides\* of the kings of gods and demons in wisdom and knowledge, who  
easily bears the unequalled heavy burden of government placed on him by the  
king, who has both physical strength and knowledge in political science, who  
is a beloved friend of the king, renowned, and knows when to make war and  
peace (has assented to this).

This was engraved by the learned Mádhava on the 13th of the bright  
half of the month of Jyeshṭha in the 9th year of the prosperous reign of  
Mahārājā Yajāti, king of the three Kaliṅgas.

\* S'rihaspati and S'ukra, the regents of the Planets Jupiter and Venus.

*Metrical Translations from the Quatrains of 'Umar Khayyám.—By*  
P. WHALLEY, C. S., *Muráddábád.*

## I.

پرخون ز فرقت جگرے نیست که نیست  
شیدای تو صاحب نظرے نیست که نیست  
با آنکه نداری سر سودای کسی  
سودای تو در هیچ سرے نیست که نیست

There's not a heart but bleeds for thy disdain ;  
There's not a sage but has gone mad for thee ;  
And though for love thou giv'st no love again,  
There's not a brain that from thy love is free.

## II.

می در کف من نه که دلم در تاب است  
وین عمر گریز پایی چون سیلاب است  
برخیـز که بیداری دولت خواب است  
برخیـز که آتش جوانی آب است

Drink, drink ! Like quicksilver I see with ruth  
Life from thee slide :  
And false is fortune, hope a dream, and youth  
Ebbs, like a tide.

## III.

ز آن پیش که غمها شب خون آرند  
فرمای بنا تا می گلگون آرند  
تو زر نه ای عاقل نادان که ترا  
در خاک نهند و باز بیرون آرند

Come and ere sorrows swarm up to harry us,  
Idol mine, blithely the wine-cup we'll drain.  
*We* are not gold that the rough hands that bury us  
Ever should care to exhume us again.

## IV.

ما لعبت کانیـم و فلک لعبت باز  
از روی حقیقتی نه از روی مجاز

بازیچه همی کنیم بر نطـع وجود  
رفتیم بصندوق عدم یکیک باز

We are but puppets danced by juggling fate,  
To trim the phrase no jot of truth I bate,  
On Being's board we serve to dress a play,  
And, played our little game,—we're packed away.

## V.

از خالق کردگار و از رب رحیم  
نومید مشو بچرم عصیان عظیم  
گرمست و خراب مرده باشی امروز  
فردا بخشد بر استخوانهای رمیدم

Though steeped in sin, let no vain qualms be thine,  
Nor fear to meet thy Maker. Death atones.  
Die drunk and reprobate. His sun will shine  
As bland as ever on thy rotting bones.

## VI.

از آب و گلم سرشته من چه کنم  
زین پشم و قصب تورشته من چه کنم  
هر نیک و بدی که آید از ما بوجود  
تو بر سر من نوشته من چه کنم

Earth, water,—such is the sum of us :  
Monk, priest,—Thou hast made us the same,  
Fame, shame,—all that may come of us,—  
Thine is the honour,—and thine is the blame.

## VII.

گر من ز می مغانه مستم هستم  
ور کافر و گبر و بت پرستم هستم  
هر طایفه که به من گمان دارد  
من زان خودم چنان که هستم هستم

I am drunk with old wine ? So I am.  
A rank libertine ? So I am.  
Let them think of me what they will,  
I am mine : As I am, so I am.

## VIII.

احوال جهان بر دلم آسان میکن  
و افعال بدم ز خلق پنهان میکن  
امروز خوشم بدار و فردا با من  
آنچه از کرمّت سزد بما آن میکن

Lighten my cares and my sorrow,  
Hide from my fellows my guilt,  
Keep me happy to-day,—and to-morrow  
Deal with me as Thou wilt.

## IX.

فوج متفکراند در مذهب و دین  
جمع متحیراند در شک و یقین  
ناگاه منادئ بر آید ——— د ز کمین  
کای بیخبران راه نه آن است نه این

Some trust their church or creed to bear them out,  
Some pray for faith, and tremble at a doubt.  
Methinks I hear a still small voice declare  
‘The way to God is neither here nor there.’

~~~~~  
“*Further Proofs of the Polygamy of Kálidása's Heroes.*”—
By G. S. LEONARD, Assistant Secretary, Asiatic Society, Bengal.

Bábu Prannáth Paṇḍit in a paper entitled ‘Morals of Kálidása,’ published in Part I, No. 3, 1876, of the Asiatic Society’s Journal, has raised the question of the Monogamy of Kálidása’s Heroes, from which Mr. Grierson of Rangpur has dissented, and in support of which opinion he has adduced some proofs. As I quite agree with Mr. Grierson on this point, I beg to produce some further proofs to show that the majority of Kálidása’s Heroes practised polygamy.

I begin with Dushyanta, and adduce the following passages from the drama of Sakuntala, in which he is a principal actor, and where Kálidása the author has not scrupled to declare the polygamy of his hero, like that of the majority of Indian Princes, both in ancient and modern times. In the first place Dushyanta’s admiration of the surpassing beauty of the woodland maidens, viz., Sakuntala and her two companions, and his comparing them with

the royal dames in his seraglio, plainly enough indicates his having more than one wife at home, thus :

"Dusha. Oh how charmingly they look ! If the beauty of maids, who dwell in woodland retreats, cannot easily be found in the recesses of a palace, the garden-flowers must make room for the blossoms of the forest, which excel them in colour and fragrance."

In the next place we see that Sakuntala's female friends would not consent to her marriage with the king, unless he would plight his faith to love her more than the rest of his harem. Thus :

"Anusuyá (laughing). Princes are said to have many favourite consorts. You must assure us, therefore, that our beloved friend shall not be exposed to affliction through our conduct.

Dusha. What need is there of many words ? Let there be ever so many women in my palace, I will only have two objects of perfect regard ; the sea-girt earth, which I govern, and your sweet friend, whom I love.

Both. Our anxiety is dissipated."

With reference to the passage "*women in my palace*," there can be no room for supposing that the royal consorts alluded to, were concubines or sweethearts, as the word *parigraha* in the text bespeaks them to have been the Prince's partners, by *vinculum matrimonii*.*

In the 7th chapter of the story of Sakuntala in the 1st book of the Mahábhárata (and it must be borne in mind that the Mahábhárata is the ground-work of our poet's drama), Sakuntala makes Dushyanta promise the regency and succession to her issue, should she have any, in preference to those of his other consorts before she would consent to wed him. Thus :

"Sak. If this be right, then attend to my vow, the son to be born in me must be elected prince regent. If so it be, then let me be joined to thee. Be it so, replied the king, without any deliberation."

Nothing can be more explicit and plain of this hero's polygamy, than the love ditty of queen Hansamatí in Act V, whereupon Dushyanta smiling, says :

"I was once in love with Hansamati, I am now reproved for continuing so long absent from her.—Friend Mádhavya, inform the queen in my name, that I feel the reproof."

Again the speech of the chamberlain in the palace garden scene, plainly indicates the hero's plurality of wives.

Chamb. "—— mistaking the women in his apartments, and through distraction, calling each of them Sakuntala ; then he sits with his head long bent on his knees."

Siva, the hero of Kálidása's poem Kumára Sambhava, is well known

* The words Avarodha, Suddhántar, are synonymous with γυναικωνίτις, zenana, seraglio, and harem, where none but espoused wives are kept.

to have been a polygamist; for besides possessing Umá or Durgá, Káli and Gangá, he is known, like amorous Jupiter, to have transformed himself into human shapes to enjoy the loves of a Kochiní, Bagdiní, and others. True it is, as Bábu Prannáth Paṇḍit says, "That throughout the seven cantos, there is no mention of the co-wifeness of Gangá, though that was well known to Kálidása," yet we find that both his consorts Káli and Gangá are mentioned by their names in the poem as accompanying their consort in his nuptial procession to Umá. (Book VII, Verses 39, 42.)

In the Raghu Vansa, Dilipa's polygamy has been shewn by Mr. Griereson by the word *antahpura-varga*, which is a mere pleonastic expression used by the commentator for the word *avarodha* in the text, (B. I, 32) which I give here in full from Stenzler's translation:

"Rex, etsi frequenti gynæceo gaudebat, hæc feminam prudentem atque Lakshmin præcipuas suas uxores existimabat."

The next hero of the poem, Raghu, from whom it derives its name, is expressly mentioned by the poet to be married to several princesses, nay, as many as stars of heaven, in beauty and number, as is described in Book III, Stanza 33.

"Deinde, statim post solemnem crinium tonsuram, pater ejus matrimonii cærimoniam peregit; atque principium filiæ, illum maritum optimum adeptæ, splendebant sicut Dakshæ filiæ, tenebrarum fugatori nuptæ."

Kálidása describes Raju's son Aja as a chivalrous Knight competing for *svayamvara* or marriage election, in which case the poet had no need of narrating his former marriage, mention of which may be found in the Rámáyana, and therefore the question of his polygamy cannot be determined.

Dasaratha, the son of Aja and father of Ráma, is a well known polygamist, as is admitted by Bábu Prannáth Paṇḍit, and Kálidása has had no hesitation in mentioning his numerous wives by their names, and the degrees of their attachment to the King. B. X. Stanzas 59—60. Thus:

"Dilecta ei erat Kausalyá, amata quoque uxor e Kekayæ familia orta; ideo rex Sumitram ab utraque honoratam videre optabat."

In short, most princes of the solar race may be shewn to have been polygamists, but as they do not form the heroes of our poet, it is unnecessary for me to give their names.

I have thus shewn by quotations from Kálidása's works that the majority of his heroes were polygamists. The grounds upon which Prannáth Paṇḍit appears to build his theory of the monogamy of Kálidása's heroes are shortly these,—The bridal benediction—the great attachment of certain kings to certain queens—and the excessive grief of some of his heroes on separation from their consorts. On these three points I would wish to make a few concluding remarks.

The fact is that Kálidása was no greater advocate for monogamy than he was for polygamy, nor did he attach any greater importance to the one than to the other, as is evident from the passages cited above, as also from the absence of a single expression in his works, giving preference to the one or other state. The benediction "Ma^yest thou gain the *undivided* love of thy husband," the blessing pronounced over Umá by the matrons, was only used in conformity with the general mode of well wishing to young brides, though the consummation of the *blessing* is one which rarely falls to the lot of any woman of this country.

The poet's description of the greater attachment of a prince to a particular consort, as in the cases of Sudaxiná and Indumatí, serves only to show the particular honor and regard due and paid to the *pát-ráni* or *pradháná mahishí*, whose offspring alone was entitled to succeed to his crown and throne.

Kálidása's long-winded elegies of woe at the separation of lovers, as in the cases of the heart-rending lamentations of Aja, Ráma, Rati, and Nala, are only descriptive of the excessive love and fondness that a lover might naturally have for the particular object of his esteem and affection in preference to all others. This can be proved by the following quotation from the poet himself.

"Nam apum examen, ctsi innumeri flores verno tempore florant, præcipua Mangiferæ adheret."

So also the professed devotedness of the wanton Krishna to Radha, whom he addresses in the following enraptured strain, does not in any way prove the singleness of his love.

"Thou art my life, thou art my ornament, thou art a pearl, in the ocean of my mortal birth; oh! be favourable now, and my heart shall eternally be grateful."

The frantic lamentations of Pururavas and Dashmanta are but graphic pictures of distracted lovers, and bear no resemblance to the calm and constant love of a monogamist placed in the same circumstances.

The characters of Ráma in the Raghu, and Nala in the Nalodaya of the poet, are undeniably pure instances of monogamy, but such exceptions to polygamy are extremely rare.

Note on Khánjá Khán Garh in the District of Bardwán, Jahánábád Sub-Division, Bengal.—By GOUR DÁS BYSACK, *Deputy Magistrate, late of Jahánábád.* ●

In the days of the Emperor Jahángír, Bangbara Khán, the founder of Koṭ Simulgarh, came to Bengal, and first settled twelve miles south of Bardwán in the village of Salímábád on the banks of the Damúdar. Many may doubt the authenticity of his advent to this country in the time of Jahángír. But from inquiry on the subject we find that Mukanda Rám Chakravarti, Kavi Kankana, wrote his celebrated work, the Chandi, during the latter part of Akbar's reign, i. e., in the time of Rájá Mán Siñha's rule in Bengal, that this learned poet was a native of the village of Dámunyá, in the vicinity of Koṭ Simul, about ten miles north of Jahánábád, and that he received a sanad from Nawáb Khánazád Khán or Khána Khán, the son of Bangbara Khán. Rájá Mán Siñha ruled in Bengal from the year 1589 A. D., and left this country in the beginning of the reign of the Emperor Jahángír (1604 A. D.). It is not likely that Kavi Kankan died immediately on returning to his native village Dámunyá from Arar-Brahmana where he composed his Chandi. It was while he was still living, and most probably after the death of Bangbara Khán, that Khánazád Khán, the son of Bangbara Khán, was dignified with the title of Nawáb, and was commissioned by the Emperor to rule in this country.

It has already been said that Bangbara Khán first fixed himself at Salímábád, but it cannot be admitted as a fact that he was the founder of that village. It is supposed that the village of Salímábád was either founded by Sulaimán, the last but one Afghán king of Bengal, or by some functionary of his. On looking into ancient records we are satisfied that the name of the village has ever been written and read as Salímábád. If it had been founded by king Sulaimán, it was but just to have it called after his name Sulainánábád. There is sufficient proof also of its not having been founded in the days of the Emperor Jahángír (Salím). Sulaimánábád was in existence at the time of Kavi Kankan's composition of the Chandi. It is written in his work* that the owner of the village of Dámunyá was an inhabitant of Salímábád.† Now the Chandi was written in the days of Akbar when Bengal was in the

* সহর সোলিমাবাদ, তাহাতে সুজনরাজ,
নিবস নিয়োগী গোপিনাথ ।
তাহার তালুকে বসি, দামুন্যায় করিকৃষি,
নিবাস প্রকৃষ ছয় সাত ।।

† In those days one Gopí Náth Niyogí was the owner of the village.

hands of Rájá Mán Siñha. If we suppose that this town had been founded in the time of Jahángir, we cannot account for its existence in Akbar's days. At the time when the Emperor Jahángir sent Qutb-uddín to kill Sher-Afkan, the first husband of Núrjahán, one Bangbara Khán by name is said to have assisted him in the atrocious deed. It seems that this person was the progenitor of the Khán family of Koṭ Simul. On his coming to Salimábád, he held the office of Tahsildár or Collector of Revenue, and commemorated his name by the erection of a mosque* and the excavation of a long tank or jhil. The mosque is now in ruins, and the tank, too, for want of repair, is in a bad state. It is said that after remaining at Salimábád for some time, he went to Dashghara on the invitation of the Rájá† of that place. One day he started on a hunting excursion, and by chance reached a jungle on the west bank of the Damúdar, and here he was charmed with the natural scenery and longed to make it the place of his abode. In accordance with his wish, the whole jungle was cleared within a short time and a dwelling house was built on the spot. This primeval jungle had been full of Simul trees—*Bombax heptaphylla*. In the current language *Koṭ* means limit, barrier, or surrounding; the village was girdled with Simul trees and hence it was called *Simulkot*.

Tradition has preserved a curious story about the settlement of Bangbara Khán at Koṭsimul. When Bangbara came a-hunting from Dashghara, he had a hawk with him. On coming to the forest of Koṭsimul, he let loose his hawk to attack an aquatic bird. In a few seconds the hawk was defeated in the contest. The Khán, therefore, thought the place to be sacred, and caused his mansion to be erected there. The early history of our land is full of legends in which it is difficult to distinguish the wheat from the chaff. Nothing in this country, not even the most trivial act or event, such as a migration from one place to another, or the selection of a particular site for a dwelling place, could be done or allowed to occur without invoking supernatural aid; every little circumstance or occurrence must be preceded by some superhuman cause or agency. Similar legends prevail at other places to account for their origin or for their names. This story of Bangbara Khán's selection of his place and abode may have

* It is said that there was in this mosque a stone bearing an inscription, but nobody knows where the stone is or has been removed to. The oldest Muhammadans in and about the Garh assured me that it was removed to the Masjid at Salimábád, which is near Chakdigi, eleven miles south of Mi'mári Station. Inquiry was made there, but no trace of the stone could be found. Some people, however, stated that the stone had been taken away from the new Masjid at Salimábád by one of the Collectors of Bardwán; but while at Bardwán, and even afterwards, I made careful enquiries, but could obtain no clue of the stone or the inscription it bore.

† Nárúyan Pál was the Rájá alluded to.

been borrowed from, or given rise to, the legend of the origin of the name of Birbhúm: it will be found that a heron killing a hawk at some spot within that district led to the adoption of the name of Birbhúm; *vide* Annals of Rural Bengal, Appendix D, page 427. But it is forgotten that Birbhúm is but one of the 12 *bhúms** or districts in which part of Rádhá was divided.

Tradition has it that after a few years the rule of Bangbara Khán became permanent in this country. The folklore on this point is, that the name of Bangbara Khán appeared on the Imperial coinage of Dihlí, and his name was beaten in the *naubat*. The fact is that, under the Muhammadan rule, even subordinate functionaries of the Government tried to assume, and in many cases did assume, independence when they came to the mufassal. And so it happened in the case of Bangbara Khán. It is probable that this Khán taking advantage of favourable opportunities which lay in his way, struck the coin and beat the drum in his own name. For this delinquency he was arrested by an embassy from the Dihlí Court. The Khán on his way to Dihlí put an end to his life, it is said by swallowing the diamond of his ring. The Imperial embassy returned to Dihlí with the dead body of the Khán. The Emperor was touched with remorse on seeing the serene face of the Khán, and asked whether he had any wife and children. The wife of the Khán and his son, then fourteen years of age, were summoned to Dihlí. On their arrival, the Emperor was moved with pity at the sight of the mother and her son Khánazád Khán, and gave him the title of Nawáb and deputed him to act in the place of his father. Nawáb Khánazád Khán, on returning to Kotsimul, caused a moat to be excavated round his mansion, 70 feet in width and 30 feet in depth. The Garh itself measures 1060 feet by 890. There is an entrance on the west side of the moat. The moat is called Khánazád Khán Garh, for it was excavated by Nawáb Khánazád Khán.

Bangbara Khán was descended of a Sayyid family. His birthplace was Barba, south of Dihlí, but his descendants have deteriorated to Bengali Musalmáns by intermixture with them, though in point of caste the Kháns are still esteemed superior. Tradition also preserves to us the story that Bangbara Khán was appointed Tahsildár over the Rájás of Dashghara, Bardwán, Birbhúm, Bishnpur, Máyapur, Goádi-Krishnagar, and Katak. How far there is truth in this assertion it is hard for us at present to determine. No authentic history has yet been found of these several principalities except of those of Bardwán, Bishnpur, and Krishnagar.

* 1, Birbhúm; 2, Sainbhúm; 3, Sik'harbhúm; 4, Gopibhúm; 5, Bámanbhúm; 6, Mánbhúm; 7, Barábhúm; 8, Dhalbhúm; 9, Singbhúm; 10, Tánbhúm; 11, Malbhúm; 12, Bhanjabhúm. *Vide* Blochmann's Geography and History of Bengal, Journal, Vol. XLII, (1873) p. 224.

Portions of the early account of the Bishnpur rāj appeared in the *Hindu Patriot*, when that paper was under the able editorship of the late Haris Chandra Mukerjee, and those numbers of the *Patriot* furnish the substance of the account given of the rāj by subsequent writers.*

The early history of Bengal is clear in regard to the one fact that the Bishnpur rāj dates from very ancient times, and that it had its existence long before the arrival of the Muhammadans in Bengal. The Rájás of Bishnpur were never subject to Muhammadan rulers. At intervals the Muhammadans invaded Bishnpur, and plundered and ravaged the country. Sometimes they experienced defeats, and fled, leaving behind them all their baggage and treasure in the hand of the victors. This state of things cannot properly be called subjection, and it does not appear probable that the Bishnpur rāj was within the fiscal jurisdiction of Bangbara Khán.

On the death of Khánazád Khán, he was succeeded in his office by his son Gardai Khán. After the death of Gardai Khán, we hear of one Ghází Khán passing his days at the place as a Zamíndár and Aimadár. In his time the importance of the Bardwán Rāj-family was well established, and he was a dependant Zamíndar of the Rájá of Bardwán, who gave him the title of Chaudhuri. It was in the time of Ghází Khán that the English got possession of Bengal.

At the beginning of the English rule, much of the heritage of the Khán family which they had held from the days of the Nawáb to those of the Chaudhuri, was transferred to other hands. The son of Ghází Khán* was 'Abdur-Rahmán Khán, on whose death 'Alí Naqí Khán became the heir of the family property; he married a daughter of the Musalmán Rájá of Nágór in Birbhúm. 'Alí Naqí Khán departed this life at the age of sixty. While 'Alí Naqí was still living, the land survey and settlement of Bengal began. At the death of 'Alí Naqí Khán, his son Tafazzul Husain Khán was a minor of only four years of age, and on the death of the latter, his son Tasadduq Husain Khán became the heir. He is still living, enjoying his ancestral heritage. He has a little son, but no daughter. It is remarkable and worth noting that from Bangbara Khán to Tasadduq Husain Khán, no one had a brother or a sister. The family has hitherto continued and been represented by a single male scion in each generation, an occurrence as rare as it is singular, nay almost unprecedented in a genealogy consisting of so many as seven or eight generations. Very little is now left for the support of the family. They eke out a bare subsistence from the few acres of land in their possession.

* *Vide* also Col. Gastrell's Report on Bishnpur; and Grant's Vth Report.

Three Translations from the Hamāseh.—By C. J. LYALL, C. S.

I.

Ta'abbata Sherrā in praise of Shems son of Mālik.

إني لمهد من ثنائى فقاصد	به لابن عم الصدق شمس بن مالك
هز به في ندوة الحى عطفه	كما هز عطفى بالهجان الأوارك
قليل التشكى للمهم يصيبه	كثير الهوى شتى الذوى والمسالك
يظل بموصاة و يمسي بغيرها	جحيشا و يعروري ظبور المهاالك
ويسبق وفد الربيع من حيث يفتحى	بمنخرق من شدة المتدارك
إذا حاص عينيه كزى النوم لم يزل	له كالى من قلب شيكان فأنك
و يجعل عينيه ربيثة قلبه	الى صلة من حد اخلق باتك
إذا هزة في عظم قرن تهللات	نواجد أفواه المنايا الضواحك
يري الوحشة الانس الانيس ويهتدي	بحيث اهتدت أم النجوم الشوابك

Lo now! I take my way with the boon of my praise in hand
to the son of the uncle of Stoutness, Shems the son of Mālik :

I will gladden therewith his heart in the ring where his kinsmen sit,
as he gladdened mine with gift of goodly *arāk*-feeders.

Little he heeds the pain of labour that lights on him—
many his heart-stirrings, divers his ends and ways ;

He journeys day-long in a waste, and at night-fall he enters another
unholpen : he rides bare-backed the steed of perilous deeds.

5 He outstrips the sweep of the wind as it drives in its course along
in a whirlwind, following swift on the heels of him who flees.

When the needle of sleep sews up his eyen, there wanteth not
a warder to watch, the heart of a wary man and bold.

He makes his eyen the scouts of his heart, to bid him where
to draw forth from its sheath the glittering sharp sword-blade ;

When he shakes it in the breast-bone of a foe-man, there flash abroad
the hindmost teeth in the open mouths of the laughing Dooms.

He deems the Wild the sweetest of friends, and travels on
where there journeys above him the Mother of all the clustered stars.

NOTES.

The measure of this poem is the second form of the *Tawil*, and runs thus :

— — — | — — — — | — — — | — — — || — — — | — — — — | — — — — |
— — — — | — — — — | — — — — | — — — — | — — — — | — — — — | — — — — |
— — — — | — — — — | — — — — | — — — — | — — — — | — — — — | — — — — |

v. 1. "Son of the uncle of Stoutness," a periphrasis for "a stout and valiant man"; the words father, son, and brother are frequently joined to qualities to denote the possessor of them: thus *Ṭarafah* (Mo'all. 86) calls his sword *akhū thiqatin* "brother of faithfulness."

v. 2. "I will gladden his heart," literally "I will shake his side," i. e. with mirth and joy. "*Arāk*-feeders"—she-camels fed on the *arāk*, a shrub (*Salvadora Persica*) widely distributed in the sandy soils of the East; in Western India it is known as *Pilā*.

v. 4. "He rides bare-backed the steed of perilous deeds" is explained as meaning that he encounters dangers with nought to protect him from them.

v. 8. "There flash abroad;" the word *tehellala* is used specially of the lightning. "Dooms," *el-menāyā*, plural of *meniyyeh*, the Fates of men; it is probable that the pagan Arabs conceived of these as women, like the Fates and Norns of Roman and Norse mythology. 'Amr son of Kulthūm says (Mo'all. 8).

و انا سوف تدركنا المنياء مقدره لنا و مقدرينا

And as for us—the Fates will surely reach us:
doomed are they to us and we to them.

v. 9. "The Mother of all the clustered stars" is variously explained; some say that it means the Sun (feminine in Arabic as in German), as the greatest of all the heavenly bodies: others that it is the Milky Way; to me it seems most probable that it means the Heaven, and that the solitude which is spoken of in the first half-verse is further described in the second by saying that the wanderer's only companion on his way is the turning Heaven.

II.

'Amr son of Ma'di-kerib.

ليس الجمال بميزر	فاعلم و ان رديت بردا
ان الجمال معادن	ومناقب اورثن عجا
اعددت للكدثان سا	بغتة و عداا علد
نهدا و ذا شطب يقدر	البيض و الابدان قد
و علمت اني يوم ذاك	منازل كعبا و نهدا
قوم ادا لبسوا الحديد	د تنمروا حلقا و قد
كل امرئ يجرى الى	يوم الهياج بما استعدا
لما رأيت نساءنا	يفحصن بالمعزاء شدا
و بدت لميس كأنها	بدر السماء اذا تبادا
و بدت محاسنها التي	تحفي و كان الامر جدا
نازلت كبشهم و لم	ارمن نزال الكيش بدا
هم يفترون دمي وان	ذران لقيت بأن اشدا
كم من اخ لي صالح	بوائيه يبدى لعدا

NOTES.

This poem is in the *Kāmil* (dimeter hypercatalectic) and is scanned thus :

— — — — | — — — — || — — — — | — — — — | —

- v. 1. "*burd*" a striped woollen stuff of el-Yemen, counted of great price.
 v. 2. "a noble stock": *ma'adin*, plural of *ma'din*, literally "mines": hence, the origin of a family or race.
 v. 3. "a hauberk flowing": *sābighah*, *dir'* being understood: a coat of mail that reaches to the ankles.
 v. 4. "a grooved blade": *Ḍū shuṭub*. *Shuṭub* or *shuṭab* are the grooves on a sword made for the blood to flow off after a stroke. "Bodies of men" *abdān*: this may mean also "short coats of mail"; but here it seems best to take it in the more usual sense. The sword of 'Amr son of Ma'dī-kerib, called *ḥ-Ṣamṣām* or *ḥ-Ṣamṣāmeḥ* ("the short and stout, compact and heavy"), which he inherited from the Himyerite Kings, was one of the most famous blades of Arab legend.

After this verse comes another in some editions

و مثقفا ترصا اذا يمهنة الاقران سدا

And a straight spear-shaft that quivers when
 I poise it, aiming it straight and true.

v. 8. "Furrowing the hard earth as they ran" *yefḥaḥḥa bil-ma'z'd'i sheddā*. The verb *fahḥa* is explained as meaning "making holes in the earth like *afāḥiḥ*," plural of *afḥāḥ* which is the nest of the Qatā. But this sense seems inappropriate, as the swifter the flight the less impression would the runner's feet make on the ground; another reading is *yemḥaḥḥa*, from *mahḥaḥ*, which means to run swiftly: also to glance, gleam, of lightning.

v. 11. "Their chief": *kebsḥ*, literally, "ram." This word is frequently used to denote the leader of a troop, as the ram leads the flock: *e. g.* in the Mo'all. of El-Ḥārith son of Ḥillizeh, v. 50.

حول قيس مستلئمين بكبش قرطي كانه عبلاء

Round Qeys, his men clad in mail with a *chief*
 of el-Yemen, as though he were a hard white rock.

(*Qaraḍīy* means 'of el-Yemen', because that is the land of the *Qaraḍ* or leaves of the *selen* [*Mimosa flava*, Forsk.] wherewith hides are tanned.)

v. 11. "Profit nought at all": *lā yercudla zendā*; *zend* means a fire-stick, and the literal meaning of this proverbial expression is "will not bring as return so much as a fire-stick."

v. 16. This 'Amr was counted, in the battles of el-Islām, as equal to a thousand men. "The Khalifeh 'Omar' (we read in the Aghānī, XIV. p. 28) "sent to Sa'd son of Abū Waqqāṣ, his general in el-'Irāq, 'Amr son of Ma'dī-kerib and Ṭuleyḥah son of Khuweylid el-Asadī, and wrote to him 'Lo! I have sent to aid thee two thousand men.'"

v. 17. "Lonely abide as sword in sheath": *baqitu mithla-s-seyyf ferdā*. The loneliness is explained in two ways: first, because the sword has no companion in its sheath; and second, taking *es-Seyf*, "the sword," as meaning the incomparable blade *ḥ-Ṣamṣām* which had no fellow or like.

III.

Ta'abbata Sherrâ went forth to woo a woman of 'Abs, of the house of Qârîb, who first inclined to him and promised to marry him; but when he again visited her, he found her averse from him. "What hath changed thee?" said he: she answered—"Verily the honour of being thy wife is great; but my people said to me: 'What wilt thou do with a man who will surely be slain to-day or to-morrow, and thou be left husbandless?'" And he turned away from her, and said—

قالوا لها لا تنكحيه فانه	لاول نصل ان يلاتي مجعاً
فلم ترمن رأى فتيلة وحازرت	تبعها من لابس الليل اروعا
فليل غرار النوم اكبر همه	دم الثأر او يلقي كميّا مسفعا
يمامعه كل يشجع قومه	وما ضربه هام العدى ليشجعاً
قليل ادخار الزاد الا تعلقه	فقد نشز الشرسوف وانتصق المعاً
يبيت بمغني الروح حتى الفقهه	و يصبح لا يحكي لها الدهر مروعاً
علي غرة او نهزة من مكانس	اطال نزال القوم حتى تسعسا
ومن يغرب بالاعداء لا بد انه	سيلقي بهم من مصرع الموت مصرعاً
رأين فتى لا صيد وحش يبهه	فلو صافحت انسا لصافحه معاً
ولكن ارباب المخاض يشقههم	اذا اقتفروه واحدا او مشيعاً
واني وان عمرت اعام انني	سألقي سنان الموت يبرق اصلعاً

They said to her—'Wed him not! for his life is nought at all:
the first spear-point that he lights on perchance shall stretch him
[dead.]'

And she gave no whit of heed to wisdom, but feared to be
the widow of one whom Night enwraps, full of hardihead;
Little he slumbers or sleeps, and the heart of his intent
is to gain the blood of vengeance, or face a foeman grim.
There comes down to fight with him whom his tribe count their bravest
[man,

but not to gain fame of valour does he smite heads in twain.
● Little he stores of food beyond what shall stay his need:
his ribs stand forth with hunger, and his bowels cleave to his back.
He has lain in the wild beasts' lairs until they know him well,
and never through fear of him have they fled from their grazing
[grounds—

He seeks not to take the hare or the deer by guile or spring:
long has he fought with men, grey is he and old therein.
And he who deals ever with warfare, it cannot but be that he
shall meet one day therein a fall from the hand of Death.
They see a man whose heart cares not to hunt the deer,
and if they could grasp man's hand, they would verily grasp his hand.

10 But he—the lords of fat camels grow lean through fear of him,
 as they follow his track alone or girt with a company.
 And as for me, well I know that, though I live long, at last
 I shall meet the spear of Death flashing bare before mine eyes.

NOTES.

The metre of this poem is the same as that of the first piece.

v. 3. "Little he slumbers or sleeps": *qalilu ghirdri-n-naumi*. *Ghirdr* is the beginning of sleep, drowsiness; the force of *qalil* being to deny altogether, the phrase means that he sleeps not at all, nor does he ever suffer drowsiness to creep over him. "A foeman grim": *kemiyyan musaffu'a*; *kemi* is one fully armed: *musaffu'* means stained or blackened with the rust of armour which is constantly worn. So er-Rabî' son of Ziyâd says—

ومساعرا صداء الحديد عليهم وكانما طلي الوجوه بقار

And stirrers of the flame of battle—upon them the rust of steel,
 even as though their faces had been besmeared with pitch.

v. 4. "There comes down to fight with him": the person spoken of may be either Ta'abbata Sherrâ himself (which seems best) or the warrior mentioned in the last words of the verse before.

v. 9. "They see" *i. e.* the wild beasts: verse 8 is a parenthesis, arising out of the second hemistich of verse 7. To grasp the hand is a sign of friendship and good will in Arabia as in Europe.

v. 10. "Fat camels": *makhâd*, properly "pregnant camels," which were held to be the most delicate of flesh (see Tarafch, Mo'all. 93).

*Notes on, and Translation of, three Copper-plate Inscriptions from
 Sambalpur.—By PRATÁPACHANDRA GHOSHA, B. A.*

In the Proceedings of the Asiatic Society for November 1872, under the head of presentations received, the receipt was announced of a Copper-plate Grant consisting of three leaves, found in the Sambalpur District. The plates were presented to the Society by Capt. M. M. Bowie, then Deputy Commissioner of that district. The plates were found buried in an earthen vessel, at some depth below the surface in the Tributary State of Patná attached to the Sambalpur District. The inscription records the grant of a village named *Vakavedda* on a small rent to four Bráhmans of four different *gotras*. The grant was made on the 8th lunar day of the bright half of the month of *Ashadha* in the 6th year of the reign of *Jana-mejaya*.

The plates are in tolerable preservation. The inscription runs over three oblong tablets connected together by a solid copper ring. The first covering plate is inscribed on one side only, and the last has but two lines of inscription on the second side. The ring is surmounted by a round

seal with a thick border. The legend on it is unclear. It has been much affected by age, and the faint but rough relief impressions lead me to surmise that it had at one time a figure of *Rámachandra* seated on a lotus, and surrounded by lotus leaves and flowers. At the foot of the lotus throne there appears to be a kneeling figure, evidently of *Hanumána*, for it has a tail.

The character of the inscription is of the 12th century; the ॐ of the inscription, however, is of as ancient a form as is met with in the *Kutila* type. The vowel signs are nearly identical with those of the Bengali alphabet. It is, however, noteworthy to observe that the ancient forms of ॐ , ॐ , ॐ and ॐ occur in this inscription. The ॐ , ॐ and ॐ are closely allied to the Bengali type. The language is Sanskrit, and the metre of the slokas which close up the inscription is in the long distich. The grammar on the whole is correct, but errors and omissions committed by the engraver are numerous.

The inscription opens with the simple auspicious "*Svasti*" in the style of a proclamation from *Mahábhava Gupta*, evidently a son or scion of the family of *Çiva Gupta*, the monarch of the three Kalingas. The place is then described, and the conditions of the grant are set forth; the annual rent being fixed at 8 *palas* of silver. A *pala* according to *Amara Sinha* is "*Karsha chatuṣṭaya*", i. e. weighing 32 *tolás*. As usual, in granting the village its mines are also given away.

The second tablet describes the recipients who are all evidently *Bhattachas* (heralds?) by profession. The first is of the *Kauchekhha gotra*, which is not known in this part of the country. The *pravaras*, that is the *rishis*, allied to the family are *Angirasa* and *Varshayauvanáçva*, and those of next to kith and kin are *Yuvanaçva*, *Damvarisha* and *Angira*, professing the *Kauthama* section of the *Sámveda*. These are all evidently *páçchatya Vaidika* *Bráhmans*, that is to say, the *Urias* of the Western clan. The first donee's name is *Dámáka*, the son of *Aiprali*. He came from a place called *Leraçringa* in the valley of the *Pampa*. The second is of the *Gautuma gotra*. The second, third, and fourth all belong to the *Kánva* section of the *Yajurveda*, the second comes from *Upaçringa*, the upper peak as contradistinguished from *Leraçringa* of the first donee. The third is named *Vásudeva*, the son of *Hrishikesha*, of the *Kashátreya gotra*. The fourth, though coming from the same valley as the first, is of the *Agasti gotra* and named *Konḍadeva*, the son of *Rámaçarmá*.

After the description of the donees, the usual imprecations are fulminated against the resumption by the future princes of the lands and the usual quotations from the *Dharma Çastras* are added in which the donors of lands are praised, and their resumers are condemned as heinous sinners.

The engraver, an employee of the son of *Malládhara Datta*, the minister of the States, is a *Káyastha* of the *Ghosha* family.

The inscription closes with an eulogium on *Janamejaya*, whose name has been used in the plate. What this *Janamejaya* had to do with the grant is not at all evident from the inscription. The donor entitles himself as the king of the *three Kalingas*, a title not uncommon with the *Uria* kings of the 10th and 12th centuries to adopt (*vide* J. A. S. B., p. 21, 1869).

Until we can identify the *Janamejaya* of this inscription, it is needless to make an attempt at fixing the date of this grant. There is, however, one important point deserving of notice; in this plate mention has been made of the *Ghosha* family of the *Káyasthas*, a family which traces its descent from the days of the earliest of the *Vedas*. In the *Rigveda*, the twain *Aśvinas* are said to have given a husband to the unmarried daughter of *Ghosha*: *Ghosháyai chit pitrishade durone patim juryantyai Apvinda-dattam*. R. V., i. 117, 7. *Sáyanáchárya*, however, says *Ghoshá* was daughter to *Kakshivat*.

Transliteration of the Copper-plates.

Plate I.

ॐ स्वस्ति नमस्तस्मै समावासित श्रीमते विजयकटका(त्) परमभट्टारकमहाराजाधि-
राजपरमेश्वरश्रीशिवगुप्तदेवपादानुध्यातपरमसाधेश्वरपरमभट्टारकमहारा-
जाधिराजपरमेश्वरसोमकुलतिलककलिकलिकाधिपतिश्रीमहाभगुन्नराजं दे-
वः ॥ कूषली । तुङ्गातटविषयप्रतिपक्षकवेदपासे तत्प्रतिनिवासि कुटुम्बजगपदा-
सद्विषयीय यथाकास्त्राध्यायिनः समाहृतं सन्निधात याटभट पिशुन विचिका-
वरोधजन-राजवज्रभादीन् सर्वान् राजपादोपजीविनः समज्ञापयति विदि-
तमस्तु भवतां । यथास्त्राभिरयं ग्रामः सन्निधिः सोपनिधिः सर्वबाधाविवर्जितः ।
सर्वोपरिकरकरादानसहितः साद्य मभुक् सगर्तौपरः । प्रसिद्धचतुःसिमा-
वच्छिन्नः प्रतिनिधिसयाटभटप्रवेशः नामागोचप्रवरविनिर्गतयास्त्रये-

Plate II.

भ्यो द्विजातिवरेभ्यः एककौण्डिनोऽथः अङ्गिरस वर्षेयोवनाश्रमवरः युवनशब्दभिरिष-
दङ्गिर अनुप्रवरः सामवेदे कौथुमशास्त्राध्यायी पम्यासरसि विनिर्गतलेङ्गुङ्गावा-
स्य मङ्गपुत्र दामाकः ऐरल्लिद्युतः द्वितीयो गौतमगोत्रः अङ्गिरसप्रवरः वार्हस्पत्यानु-
प्रवरः यजुर्वेदे काण्डशास्त्र उपपङ्क्तविनिर्गतखण्डसेचवास्त्रयमङ्गपुत्रनेारपगखद्युतद्वतीय-
श्चकपाचियगोत्रः अर्चनम्नस्रप्रवरः श्रवोश्चन अनुप्रवरयजुर्वेदकाण्डशास्त्रा-
ध्यायी कौण्डिकपुत्र(?)विनिर्गत लेपतुङ्गावास्यमङ्गपुत्रवाद्युदेवः रिभिकेशमु-
तः चतुर्थश्च अगस्त्यगोत्रः । इक्ष्वाकुप्रवरः अथानुप्रवरः ॥ च यजुर्वेदे
काण्डशास्त्राध्यायै सकलिङ्गविनिर्गतः पम्यासरसि वा
स्यः कौण्डदेवनाम रामशर्माद्युतसेभ्यो द्विजातिवरेभ्यः सल्लिखारा ।

पुरःसरः माध्वन्तारर्क्षितिसमकालोपभोगार्थं प्रतिवर्षदातव्यकष्टपक्ष-
करदानविनिश्चित्य मातापितोरात्मनश्च पूष्यश्रोऽभिष्टब्धये तावद्भासनेना-
करिक्त्य प्रतिपादित इत्यवगम्य समुचितभोगार्थं मातापितोरात्मनश्च पूष्यश्रोऽभि-
ष्टब्धये तावद्भासनेनाकरीकृत्य प्रतिपादि इत्यवगम्य समुचितभोगभागकरश्चिर-
ण्यादिकसुपमवर्द्धिर्भवद्भिः सुखेन प्रतिवस्त्यमिति भाविभिश्च भूपतिभिर्देतिरियमस्य-
दीया धर्मगौरवाद्दत्तदुनुरोधाच्च स्यदतिरेवानुपासनीया । तथा चोक्तं धर्मशास्त्रे । वज्रभि-
र्व्यस्तुषा दत्ता राजभिः सगरादिभिः । यस्य यस्य यदा भूमिस्तस्य तस्य तदा फलं ॥ माभुदफलं
शङ्कावः परदमेति पार्थिवाः । खदानात् फलमानन्त्यं परदत्तानुपासने ॥ षष्ठिवर्षस-
ञ्चालि स्वर्गे मोदति भूमिदः । आच्छेत्ता चानुमन्ता च ताव्येव नरको वसेत् ॥
(अग्नेरपत्यं प्रथमं सुवर्णं भूर्वाण्यविस्मर्यस्तुताश्च गावः ।) यः काश्चनं गावः मयी-
ञ्च दद्यात् दत्तास्त्रयस्त्रेण भवन्ति लोके ॥ आस्तोऽयमिति पितरः प्रवर्णयन्ति पि-
तामहा । भूमिदाता कुलजाताः स नस्माता भविष्यति ॥ भूमि यः प्रतिश्लक्षति यस्य
भूमिं प्रयच्छति । उभौ तौ पण्यकर्माणौ नियतं स्वर्गगामिनौ ॥ तद्गागानां सञ्च-
ञ्चालि वाजपेयशतानि च । गवां कोटि प्रदानेन भूमिर्दत्ता न शुद्धति ॥ हरते च-

Plate III.

रयने यक्ष मन्दबुद्धिः तमोऽहतः । स वज्रो वारुणैः पार्श्वौशीर्यंघोनीश्च गच्छति ॥
खदत्तां परदत्ताम्वा यो हरति वस्तुन्वरां । स विष्टायां कृमि भूला पिडभिः सञ्च पश्यति ॥
आदित्यो वन्द्यै विष्णुर्ग्रेष्ठा सोमो ऊताग्रनः । शुक्लपाणिश्च भगवानभिनन्द-
न्ति भूमिदं ॥ सामान्योऽयं धर्ममेतुर्ह्येषां काले काले पाखनियो भवद्भिः । सर्वो-
न्नेतान् भाविनः पार्थिवेन्द्रान् भूयो भूयो याचते रामचन्द्रः ॥ इति कमलदलान्मुविन्द-
लोलप्रियमनुचिन्त्य मनुष्यजिवितञ्च सकलमिदमुदाहृतञ्च वृद्धा
महि पुर्यैः परकिर्तयो विलोप्या इति परमभट्टारकमहाराजाधिराजपरमे-
श्वरश्रीजनसेजयदेवस्य विजयराज्ये सम्मत्सुरे षष्ठेः आषाढमासे सितपक्षेति-
यावदृम्यां यथाकृतोऽपि सम्बत् ६ आषाढ शुद्धि । लिखितमिदं भासनं महासाम्बि-
प्रक्षित्रीमन्त्राधारदत्तसुतप्रतिवदकायस्त्रकोद्घोषेण वज्रभयोपसृतेनेति
शैलि शैलीश्वराशमसलमश्मिन्निश्चामन्वयः कौस्तुभः शैर्यत्यागान्मुराभिः

विरचितविषयज्ञानशुद्धीकृतामः श्रीमान् जनसेजयास्त्रसुदशपतिसमः
क्षत्र्यां भोक्तकामः प्रख्यातदेशिबर्गप्रविदलनपटुभूपतिः सोमवर्ध ॥

Translation of the Copper-plates.

Plate I. Amen ! From the famous fortress of victory situated at *Murastima* (?), the most venerable great ruler of rulers and Sovereign-lord *Śrī Īiva Gupta Deva*, descended from whose feet the devout worshipper of *Maheṣvara*, most venerable, great ruler of rulers, and Sover-

eign-lord, the Glory of the Lunar race, and King of the Three Kalingas, *Śrī Mahābhava Gupta Deva*, Lord spiritual and temporal, thus declares : All *Jāts*, soldiers, spies, *Dhitrīkās* (?), watches or guards, favourites of the Government, dependents on the foot of Royalty, and others, living at any time, in the village of *Vakaveddā*, in the confines of the territories in the valley of the *Tunga*, or in the allied countries in the vicinity. Be it known to you, that this village, with all its mineral wealth, free of all restraints, with the right of collecting all supernumerary taxes, with its mango and *mahuā* trees, with its excavations and salt lands, bounded by well-known boundaries on all its four sides, and restricted from the entrance of *Jāt* soldiers, is given by us, for the settlement of the best Brāhmanas, sprung from the principals of the different families, *viz.* :

Plate II. One of the *Kachchha* family, of the order of *Angirasa yuvanāṣva*, and sub-order *Yavanaṣva-Amvarisha-Angira*, student of the *Kauthhama* section of the *Sāmaveda*, inhabiting the *Leraṣṛingā* (Lera-chera ?) alluvion of the *Pampā* Lake, son of the venerable *Aiprali*, and named *Damaka*. The second of the *Gautama* family, of the order of *Angirasa*, sub-order *Vārhaspatya*, student of the *Kaṇva* section of the *Yajur veda*, emigrant from *Upaṣṛingā*, inhabitant of *Kaṇḍakshetra*, and son of the venerable *Naropagaṇḍa*. The third of the *Kashātreya* family, of the order of *Archanāṣva*, sub-order *Ṣvaḥṣvāna*, student of the *Kāṇva* section of the *Yajur veda*, emigrant from *Koṣhkaladda*, inhabitant of *Lepa-tungā*, offspring of the Bhattas, son of the venerable *Rishikeshā*, (*Hrshikeshā* rightly) and named *Vāsudeva*. And the fourth of the *Agastī* family, of the order of *Idhmabāhava*, sub-order *Chyava*, student of the *Kāṇva* section of the *Yajur veda*, emigrant from *Trikalinga*, inhabiting the valley of the *Pampā*, by name *Koṇḍadeva*, son of *Rāmaṣarmā*.

To these excellent Brāhmanas, I, with the sprinkling of water, for the purpose of their possession, until the duration of the Sun, Moon and Stars, at the fixed rent of eight *palas* of silver per annum ; for the sake of adding to the merit and fame of my parents, as of myself, execute this Deed of gift in the Copper-plate edict. Knowing that it is for the rightful possession (of the donees), and for the augmentation of the merit and fame of my parents, and as of myself, that this Deed of gift is executed upon this Copper-plate edict. Knowing this yourselves, you are to dwell there happily, taking rightful possession, levying, according to your respective shares, revenues, and receiving the gold and other minerals of the soil.

Let future proprietors of the soil, in due regard to our piety and renown, and for *our sakes*, maintain this grant, as of their own, as it is said in the *Dharma-Śāstras* (jurisprudence) that *Sagara* and many other kings have made gifts of lands, but the merit (of the grant) accrues to him who for the time being is the proprietor of the soil.

Doubt not of your merit, O earthly kings! because these gifts by others have been made, for endless merit awaits on him that maintains, rather than on him who confers, the same. The donor of land rejoices in heaven for a period of sixty thousand years; but their resumers and their advisers, too, dwell in the regions of hell for an equal space of years. Gold is the first offspring of Fire; Earth is the favourite of *Vishnu* and cows are the progeny of the Sun; therefore, whoever makes donations of gold, cows, and lands, these three kinds of donors do no more return on earth. Their fathers exult, and grandfathers laud (them), when their land-giving posterity thus bring about their redemption. Whoever receives a gift of land, and whoso makes a gift of it, both of them for their pious deeds ever ascend the heaven. The resumer of land is never absolved, though he should consecrate thousands of tanks, perform hundreds of *Vájapeya* sacrifices, and bestow ten millions of cows in charity. Whoever with an evil heart, dispossesses another or causes one to do such an act, being beset by darkness, he becomes fast entangled in the noose of *Varuṇa*, and degenerates into prostrate animals.

Plate III. Whoso resumes land, whether of his own giving, or given by others, becomes a worm of the dirt, and rots there with his forefathers. The sun, *Varuṇa*, *Vishnu*, *Brahmá*, the moon, fire, and the glorious *Śiva*, all bless the giver of land. This common bridge of the piety of kings should always be supported by you. This is what *Rámachandra* most expects of all future sovereigns of the earth. Reflecting on the transitoriness of human life and fortune, which is like a drop of water on the leaves of a lotus, and knowing that "this world is a fleeting show", let none obliterate the acts of others.

This Copper-plate document is written, on the eighth day of the moonlit-fortnight of *Aśhádha*, in the sixth year of the victorious reign of the most venerable, great ruler of rulers and sovereign-lord, the illustrious *Janamejaya Deva*, which to write in figure is *Samvat 6 Aśhádha, Ādi*, by *Koi Ghosha*, son of *Vallabha Ghosha* of the *Kāyastha* caste, in the service of the son of *Śri Malládhara Datta*, the Chief Minister of Peace and War.

There reigns the illustrious king of the Lunar race *Janamejaya* by name, who in purity and splendour resembles the carbuncle gem, in the family of the gemming lords of the earth. Whose valour and bounty are boundless as the ocean, and whose lawful gifts have made his name more glorious. He resembles the Lord of gods in saving the earth when in difficulties, and he is celebrated as a mighty vanquisher of the hosts of his enemies.

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Part I. HISTORY, LITERATURE, &c.

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Notice of a pre-historic Burial Place with Cruciform Monoliths, near Mungapet in the Nizám's Dominions.—By WILLIAM KING, Depy. Supdt., Geol. Sur. of India.

(With two Plates.)

About eight miles W. S. W. of Mungapet (Paluncha Taluq), on the right bank of the Godávarí, and on the road to Hanamconda, I passed over the strange place of sepulture described in this paper. It is in the midst of, and overgrown with, forest and scrub jungle, and is quite out of the ordinary route of European travellers; but as the tombs have been opened and there are signs of excavation, apparently of other hands than those of despoilers, it is possible that this spot has been visited and described by some previous observer. The only notice I can find having reference to like places in the neighbouring country is that of Colonel C. L. R. Glasford (Report of the "Upper Godavery District, 1868,") who says: "But scattered here and there in the forests, and on the sides of hills, are found the remains of a race before whose antiquity even the ancient Hindu dynasties of the Peninsula of India must probably give way. I allude to the megalithic monuments of Indo-Scythic sepulture, consisting of cromlechs, kistvaens and cairns, which have been found in four of the six taluqs of this district." This account answers generally for the locality under description, except for the presence of some stone crosses, which in my experience of such burial-places in Southern India, are quite unique. Other ruder and perhaps more ancient remains (commonly

called Korumbar rings), in some respects similar to these, are frequent over parts of the Madras Presidency; but here in addition to the presence of large crosses, the tombs are all built of worked stones, and furnished with coffin-like cavities in place of the usual urns or earthenware chatties.

The place itself is called, by the people around, *Rákshasgudium* or 'the village of demons', whom they describe in the usual way as having been as tall as trees, unclothed, long-haired, and of a time beyond the ken of man. Situated close to the present village of Kaperlaguru, it consists of an assemblage of kists or huge stone boxes for the reception of the dead, (and, if the size of some of these be taken into consideration, of very honoured dead too). The numbers of inferior people who must have been employed to quarry, dress, and carry the stones, were not buried in this place; it was the necropolis evidently of the rulers, not necessarily the heroes, of the country, for many of the kists contain two or more receptacles of different sizes as for families.

The ground occupied is about half a square mile in extent, but it is difficult to be exact as to the area or even as to the number of tombs owing to the thick forest growth, and there were only a few hours at my disposal for searching the place. There are, however, about 150 tombs scattered irregularly along the crest and western slope of a low sandstone ridge, (lying mainly in a long W. N. W.—E. S. E. group) which is rather thickly crowded with kists near the northern end, where the high road crosses the ridge. In the more crowded portion of this ancient cemetery are four large cruciform monoliths, one lying flat on the ground at the extreme northern end of the place, and three a few yards south of the road, one of which is perfect and standing in a nearly upright position.

The crosses do not seem in their position to bear any very particular relation to the tombs near them, and are too large, supposing they are not in their original sites, to have been moved far from their first position. The northern-most cross is not lying near any kist, but the upright one and another (broken and dug down to its base) are placed close to two pairs of large tombs, though their position is not strikingly associated with either of these.* The fourth monolith is lying on the ground some fifty yards further south near a tomb.

The appended sketches (Plates XI and XII, figs. 1, 2) will show the style of these singular monoliths, which I think may be termed crosses, though they differ in many respects from all ornaments or sculptures of this class, while they are I consider of much more ancient date than the type from which nearly all crosses are derived.

The two crosses in the middle ground are facing about E.—W., but not exactly; that is, the proper face may be to the sun or the reverse, for

(See Plate XII, Fig. 6.)

I cannot say which is the front or back, as each cross is placed differently with regard to its neighbouring tombs. Some of the kists face the rising sun, others are at an angle with this position, or in other words, the entrances are always easterly though at varying degrees to the south or north of this.*

The distinguishing points in these monuments are the various breadth and length of the limbs, and the curved junction between the arms and lower limb.† The broken cross in the middle ground has been dug down to in order to expose the foot; its measurements are:—whole height, 13 feet; height to arm, 9' 4"; width of lower limb, 3' 2"; length of unbroken arm from centre, 3' 8"; width of arm at end, 2' 5"; width of upper limb, 2' 1"; thickness of monolith, 1' 8". The neighbouring cross is smaller, but it stands 5' 6" over the ground, and from the proportions of the others its lower limb must be sunk in the ground for about 6 feet.

These monoliths are neatly dressed, without any ornamentation or inscription, and present a rather less weathered appearance than the kists, which were apparently only roughly squared and then hammered or chiselled on certain surfaces, though the style of tooling is the same in all cases.

Each tomb consists of four upright tooled slabs placed rectangularly, covered by another flat slab dressed at the edges, and the whole is generally encircled by a ring of rudely-dressed oblong stones meeting together at their ends, these being cut to give clean joints to the circle. The box or kist is built on the surface of the ground or, as it generally is, rock, there being no excavation or pit as is more frequently the case with the ruder Korumbar rings. One of the upright slabs is pierced for a small doorway large enough to admit a human body, and the sides of this entrance are cut or counter-sunk so as to allow of a slab or other closure being placed against the opening, though I did not see any loose slabs lying about which might have been used in this way. The covering slab overhangs the kist for more than a foot in width. (See Plate XII, figs. 3, 4, and 5.)

Most of the tombs are more or less broken and tumbled about, while their interiors have in many cases been torn up; but a few still show what the inner arrangements were like. There was or is a floor or basement slab, very often the size of the interior, in which were cut out or carved one or more long and shallow cavities with rimmed edges suitable for the reception of a corpse. The largest tomb contains two of these receptacles with room for a third; in another are three, one (ordinary size) on either side with a smaller hollow, possibly for a child, between; while there is only one small cavity nearly three feet long on one side of the floor of a further tomb.

* Possibly the fact of the entrance being to the north or south-east may have had reference to the time of death of the first tenant, according to the seasonal position of the sun.

† See Plate XII, Figs. 1 and 2.

These coffin-like hollows are narrow at the opening, but widen out towards the bottom. They are not of much size, the largest being 5' 6" long, 1' 6" wide at mouth, and 11 inches deep; and this smallness probably indicates that the bodies were embalmed, more particularly as the cavities would seem to have been cut out as they were required, the floor slab having been placed when the tomb was built. Another point in favor of the view of embalming is, that the cavities are perfectly clean, not stained as they might have been in case of rapid decomposition of the corpse.

The kists are generally about 6 feet long by 5 feet broad and, with the overhanging roof, about 4 feet high; but some are much larger. The principal tomb is 9' 6" long, and 9' wide, the covering slab being 14' 8" by 11' 6", with a thickness at the edge of 1' 4"; the whole height from the ground being 5 feet. The circle enclosing this tomb is 37 feet in diameter, the stones forming it being some of them 8 feet long.

Generally, each circle of stones encloses one tomb; but there are exceptions, such as two kists within a single circle, and again, four of these arranged in a row inside of a long elliptical ring.

The covering slab and the sides of the kist are each of a single piece of sandstone, but many of these are now cracked, and in one instance I could not tell whether the upright slab were fractured or that one part of it had been cut to fit the other as is often the case in the facing of the great stone walls of some of the Telingána fortresses. The small door-way is most frequently cut out in the upper half of one of the wall slabs, generally at one side or the other, though in a few cases it is in the middle. There does not appear to have been any covering stone for the body cavities, indeed the raised rim of these would have required a covering with perhaps more carving than the builders could elaborate.

The stone used is in all cases a very coarse grey sandstone, the rock of the place itself, but I could not see any trace of quarries though such may have been overlooked in my difficult search through such jungle. This use of the stone of the neighbourhood is another point of difference between these relics and the ordinary Korumbar rings of S. India, the latter being usually constructed of stones other than the rock of the immediate locality.

Further examination of the slopes of the low hills in the neighbourhood of Rákshasgudium brought to light other sites of similar assemblages of tombs, but these are all very poor in the number and size of the kists, while there are no cruciform stones.

The history of this place of sepulture is of course lost in obscurity, but some attempt may be made to give it a place in the archæological record. Col. Glasfurd, as shown in the extract from his report at the beginning of this paper, attributes the remains observed by him in the Godávari valley to a possible Indo-Scythic period, though I think he uses this

term in a sense to which it cannot be applied, for though there is sufficient evidence of a Hindu occupation of the country, there is little or none as to a previous Scythian one, the prior occupation having by all accounts had its derivation from the north-eastward instead of from the north-west. The mistaken use of the term Scythic may, however, be due to its being a general term for the pre-Aryan occupation of Europe, and thus adopted for the like period in India. Col. Glasfurd's Indo-Scythic time would then be the period to which I also am inclined to attribute the Rákshasgudium remains, namely, to later pre-Aryan times. Or, a narrower limit might be given in a Hindu-Kolarian period; for these tombs—supposing as I do, that they were erected by a people of the Kolarian family—are of a higher order of building than was usual with them, evidencing a later stage in the history of the people who erected tombs of this kind, and this burial-place may have been in use long after the Aryan occupation.

The absence of any inscriptions or incised ornamentation whatever would seem to place the Rákshasgudium kists and monoliths in an earlier age than that of such inscribed buildings or stones as are now extant in the adjacent country, which are either of Buddhist or Telingána workmanship. I do not remember noticing any inscriptions on the Buddhist caves of the Godávarí or Kistna valleys, but such are frequent in the Telingána ruins of Warangal and in the chain of large reservoirs extending northwards from Pakkhal tank, which last, according to the inscription on the bund, dates back some 1700 years.

It seems necessary, therefore, to look for a period whose people were less civilized than the Telingánas and who probably did not possess a written character, in fact, for a pre-Aryan race, and the remnants of this I think exist still in the few and scattered tribes of the Godávarí valley coming under the general name of Kois, who do not, however, acknowledge any acquaintance with the remains under consideration.

There seems little doubt but that these Kois are related to the Kols of Bustar and the country north-eastward by Katak, and that they are thus of the Kolarian family. This country, in the Godávarí valley, is scattered over with cromlechs and kists somewhat of the same general type as those of Rákshasgudium though of much ruder form. But, as this family of people is tracked northward, the architectural character of these becomes improved, their occurrence more frequent, and the popular theories concerning them more intelligent, until in Chutiá Nágpur, the Larka Kols or Hos, as described by Colonel Dalton, are found still making use of and erecting sepulchral and monumental collections of stones, always of ruder form, however, than the relics in question.

Without, however, taking into consideration the peculiarities of style, tooling, and mode of burial evidenced in the Rákshasgudium tombs, there

is a very general resemblance between them and the other sepulchral ruins scattered over the country above indicated and even as far south as the Kávari river, which ruins are doubtless the relics of pre-Aryan races, an early branch of whom, is possibly now represented in the small degraded tribe of Yanadis* of Striharicotta, and a later branch by the more civilized though still low Kois and Kols of the north.

Here at Rákshasgudium, however, we have the most improved form of the type burial-place, the placing of the corpse in a horizontal receptacle, and the unique cruciform monuments, all of which are evidences of civilization, possibly of the highest form at which the Kolarian people had arrived when their country was inundated by the great Aryan wave.

It is at the same time very remarkable that in the part of the country where I would have it that the evidences of the highest phase of civilization of the pre-Aryan exists, we have now only a very degraded remnant of the race with no knowledge of the ruins in question. May I suggest on this, that the Kois of the present day possibly had no direct ancestors living here at the time of the Aryan invasion, or are they the returned residue of so much of the race as was driven outwards by the invaders, or perhaps the after outspreading of those branches of the race who were never touched in the fastnesses of Sambalpur and Chutiá Nágpur by the wave of conquest, while the more refined tribes then existing became gradually absorbed into, or amalgamated with the new race.

A great difficulty in tracing out the age of these remains, presents itself in the cruciform character of the monoliths; for I believe these are unique in the pre-historic sepulchral remains of India, and it might naturally be expected that a like though rougher form of the same type should occur among the ruder examples of similar places in the neighbourhood, while at the same time it is necessary to face the apparently much easier solution of the problem that the monoliths and even the cemetery itself may be of very early Christian origin. It is, however, more probable that a more refined section of the pre-Aryan people should have had one burial-place with special monuments for their greatest families, than that a single early Christian cemetery should have been planted far inland, in the centre of heathendom without a trace of the cross being left in the countries outside.

As stated in the commencement of this paper, it is very possible some previous observer may have seen this place and recorded his observations; but I am unable to learn of such, while my means of reference to any previous literature on the subject is very small. At the same time, I must

* The Yanadis frequent the country around Pulicat Lake (Madras): and I saw, in 1863-64, two of these people producing fire by the manipulation of pieces of wood, on a rainy day, within 200 yards of a modern village.

acknowledge reference to Col. E. T. Dalton's paper on the 'Rude Stone Monuments of Chutia Nagpur and other places,'* and, more especially, to Mr. R. N. Cust's paper on the 'Non-Aryan Languages of India.†

Postscript.

My attention has been drawn to Mr. Mulheran's notices,‡ of cromlechs and stone crosses in the Godávarí valley, which bear out my supposition that these had been visited by some previous explorer. I think the burial-place referred to by Mr. Mulheran as at or near Katapur§ is clearly that of Rákshasgudium, but I have not seen the locality called Malur. It is worthy of notice that the Rákshasgudium crosses are not always to the right of the cromlechs, for it is difficult to say—See Plates XI, fig. 2, and XII fig. 6,—to what cromlechs any particular cross belongs.

Mr. Mulheran does not make out a clear case for either a Christian or even a Buddhistic origin of these crosses and cromlechs : though I agree with him that their origin is extremely puzzling. The crosses in question are not so clearly of a Latin form as Mr. Mulheran would imply ; and had they been Christian, I think they would have been placed more conspicuously as appertaining to a particular tomb, or set of tombs. I am not aware of any case of a memorial Christian cross being placed opposite the corner of a tomb, as in this locality. I know, in Ireland, of pagan places of burial or memorial|| having been christianized by the addition of christian ornaments or signs, and such might have been the case at Rákshasgudium : but the complete isolation of the place is against this view ; the monoliths themselves evidence more labour than could have been effected by a stray Christian fold, or by wandering missionaries ; there are no inscriptions ; and the proportion of the monoliths are essentially different to those of any Christian cross. It is also not known that any such form of monolith or cromlech exists now near any Christian remains in India.

Col Walker's remark,¶ as to the doubtfulness of the hypothesis of the cromlechs being the work of a "stone-implement using race," is just with regard to the cromlechs of Rákshasgudium ; for these are, I think, evidently in their tooling the work of men who used iron implements.**

* Journ. As. Soc. Bengal, Vol. XLII, Part I, No. 2.

† Proceedings, As. Soc. Bengal, Jan. 1877.

‡ Proceedings, As. Soc. Bengal, April and June, 1868.

§ My camping place at the time of my visit was at Katapur.

|| An Irish cross with figure of our Saviour : but the head of the figure is loose in a cut hollow of the upper part of the cross, and this head has small rams' horns for ears, clearly a head of Jupiter Ammon. Close to the Round-tower of Ennistymon, west of Ireland.

¶ Proceedings, As. Soc. Bengal, June 1868, p. 151.

** Regarding these cromlechs and crosses *vide* Proceedings, As. Soc. Bengal, for August, 1877 ; Indian Antiquary, Vol. IV, pp. 305, 306 ; and Ferguson, Rude Stone Monuments, pp. 486-89. En.

Notes on the Rangpur Dialect.—By G. A. GRIERSON, C. S., Rangpur.

Rangpur is and always has been a border country. With the Koch State and the Bhútan Dvárs on the north, the wild tribes of Ásám on the east, the advancing tide of Aryan civilization, and subsequent Muhammadan conquest pressing on from the west, and, worst of all, the hated Vangála from the south, it is but natural that these conflicting elements should have left deep traces of storm and turmoil on the inmost life of the people. The district itself long formed a part of the *Kraun'cha* or Koch Bihár kingdom, and being particularly exposed to invasion from all sides, it is covered with sites of battle-fields, and abounds in legends relating to national heroes. The people themselves have a legend that they are descended from a remnant of the Kshatriyas who escaped the destroying axe of Paraśu Ráma, and it is possible that a few of such families may have settled on this debatable ground, and have found a new home and a new Ganga on the banks of the Brahmaputra. They say that the *Kraun'cha* Himálaya takes its name from those recreant (*Krukta*) warriors who abandoned their father's faith, pure in its Vedic simplicity, for the dread gods of the dwellers of the mountains; and they point to their caste names and their strange religion in confirmation of the theory. Be that as it may, it is certain that Rangpur contained Hindu colonists at a very early period of Indian History. The name of one of its rivers—the Karatoyá—is even mentioned in the Mahábhārata, and the Lohityá, a portion of the Brahmaputra, which borders the extreme east of the district, is also alluded to (*Bhishma Parvan*, 376).

As usual, little attempt seems to have been made to proselytize the aboriginal inhabitants. The Hindu, while probably the most receptive, is the least missionary religion in the world. The wild savages were allowed to retain their demon worship, their "Hudum Deo", and their rites of almost Tántrik obscenity, and were formed into a caste of *Dásas* with their own customs (flesh-eating, widow marriage, polygamy, and even polyandry), their own gods and their own language. In process of time, other and even lower castes were formed, *Chanḍálas* and *Bhúmi-mális* for instance, and the *Dásas* taking up the name of their former *Rája-putra* masters, called themselves, or were called by their humbler brethren, *Rája-vamśyas*. Such is the story of the *Rájvamsí* caste, which now includes within its bond sixty per cent. of the Hindus of Rangpur.

In such a legendary history it is of course impossible to fix dates, or even to assign eras for these changes. The earliest king whose name I have found mentioned in local songs is Mánik Chandra, a *baniya* by caste. Of course he is stated to have lived in the *Satya Yuga*, which gives no era

whatever ; but I think it will be evident from a perusal of the epic poem called *Mánik-Chandra-Rájár-gán*, that he must have lived at a very early date, considerably before the Muhammadan invasion under Sháh Ismá'il Ghází, A. H. circ. 850, of whom an account was given by Mr. Damant, in Vol. 43 of the *Journal*. No character is more popular than Ismá'il Ghází in this district, and the popular songs teem with allusions to him ; and yet the epic poem above-mentioned contains no mention of him or of any Musalmán whatever. I therefore conclude that this epic must have been originally written, or rather composed, for it has been unwritten till lately, before Ismá'il Ghází's time, and, as it makes *Mánik Chandra* a king of the good old days, "when saints were many, and sins were few," he must have lived a considerable time before the Musalmán invasion.

This invasion was another important factor in forming the character and language of the people. Rangpur was for years the battle-ground between the Kraun'cha Hindus, and the invading Yavans from the west. We have traces of this existing in the topographical nomenclature of the present day : there are *Maghal Bachá* where a Hindu General escaped from the enemy, and *Maghal hát*, where one of the numerous treaties of peace was signed, and several other similar names throughout the country. But perhaps the most pregnant sign of the magnitude of the forces which were insensibly moulding the condition of Rangpur for future centuries is the existence to the present day of a vast dyke extending right across the district from east to west.

It was built to aid the defenders in withstanding Musalmán invasion. South of it, and when that became untenable, south of another farther north, were conquering foreigners, bearded strangers, bringing a new language and a new religion, and armed with all the hatred for the Káfirs which a strange language and a strange religion can give. For years the rule over the populace south of these dykes was the occupation of conquerors and not the colonization of immigrants, and that region has never since rebounded from the oppression. The Parganas south of the south dyke, are the most backward in Rangpur, and the despair of its rulers. They abound in moderately wealthy Muhammadans, descendants of the followers of Ismá'il Ghází and his compatriots, but the ra'iyats are a tribe of fetish be-ridden savages worthy of the pen of a Burton or Cameron. Too ignorant to betake themselves to the refuge of the law, their sole idea on seeing a stranger is, that he is come to extort more money from them, and thereupon they run into the jangals and hide themselves. They do this not only when the stranger is a native official, but even when he is a European. I myself have gone into villages, and have had the greatest difficulty in finding a man who was brave enough to speak to me. I would not wish it to be thought, that what I have just written has been exaggerated : it is

merely a copy, and in some parts a verbatim copy, of district reports : and it is fully borne out by my own observations.

As might have been expected, this tract forms a rich mine for the investigator into aboriginal folk lore.

The people, Muhammadans and Hindus alike, worship two gods, the *Burhí Deo*, and *Hudum Deo*. The first is a bamboo set up in the earth, to which are hung half a dozen rags and perhaps an old bottle or two. The worshippers have no distinct reason for cultivating it, except a vague idea, that if they do not, some undefined evil will probably befall them ; and so they do pújá to it, by attaching to it any old refuse they may find in their house.

The other is a kind of Indra, worshipped only by women, and only in the time of drought. They set up a plantain tree at night at a cross-road, and dance naked round it singing songs of the most horrible obscenity.

Such is the state of those who live south of the dyke. That of those on the north side presents more favourable aspects. While the former country was occupied by a foreign army, the latter was held by a people who fought for themselves and their religion with a certain amount of success. Northern Rangpur was never effectively held for any length of time by the Muhammadans, and the result is that the greater part of its population is Hindu at least in name. Although degraded, the people are not so degraded as their brethren of the south. It is true that they follow few of the customs of Hindus born nearer the source of Aryan civilization in India, situated so far to the west,—but one thing has been ineradicably stamped in their character, they know that their ancestors fought for their religion, whatever it is, and were able to retain it. There has thus been begotten amongst them a sort of local patriotism, which, if it has occasionally been a bar in the way of attempts made to help their progress, has at the same time had an effect which cannot have been otherwise than invigorating.

It may sometimes have tended to patriotism in a “parochial” sense, but it has taught the people to think for themselves and to act for themselves, and, above all, to see that under the English *Ráj* there is a reign of law which is the same for the poor man and the rich.

I have been engaged for some time past in collecting the folk-songs of Rangpur, and nowhere is the difference between these two belts of country more easily perceived than in a comparison of them. Those of the northern tract are often semi-religious lays with subjects taken from the *Mahábhárata* or *Purāṇas*, but with an individuality about them, in their language and character, which stamps them with their owners’ names. Some of them are really ambitious productions, with snatches of poetry in

them which might please even a fastidious taste, and one already mentioned deserves special notice. It is of considerable length, about seven hundred and fifty verses, and has been handed down by word of mouth for generations in a family of *Yogins*, who make their living by singing it and other songs. It is a kind of epic, and describes the life of two ancient kings of Rangpur, who lived in the *Satya Yuga*, named MĀNIK CHANDRA and GOPI CHANDRA. I have been fortunate enough to obtain a copy, taken down from the Yogins as they recite it; and I hope at some future date to be able to give a full account of it. Amidst much that is puerile and exaggerated, it contains many true touches of poetry, and gives some valuable information as to the customs of the country in bygone days. It has of course undergone many changes in its passages from mouth to mouth, but from internal evidence, as I have already said, I believe it to have been originally composed before the Musalmán invasion.

This and other northern country songs, it should be noted, are remarkable for their hatred of the *dukshīṇa deśa*, from which the evil-mind Van-gála comes.

The songs of the south are, on the contrary, either short erotic lyrics, of which the less said the better, or hymns sung in honour of *Hudum Deo* or at the Kārttika pūjā, which surpass even them in obscenity. Destitute alike of wit and of poetical feeling, they can do nothing but disgust the most unimpassioned and impartial investigator.

I propose now to give a short sketch of the grammar of the very peculiar dialect spoken in Rangpur, with a few specimens of the songs which are best adapted to illustrate my remarks thereon.

THE ALPHABET.

The Alphabet of course is nominally the same as that of Bengálí, but it contains sounds which are, I believe, unknown to that language.

For instance there is a liquid, generally a substitute for a regular *রিল ril* (e. g. নৈলান for নরিলান), which is much more nearly the Tamil lingual *l* than any other sound with which I am acquainted. It is sometimes heard at home in the London streets, when in the morning the milkmen cry "*milk*."

With regard to the pronunciation of ordinary letters it must be remarked that—

(1.) An initial *র r* is almost always elided, and generally a following *অ a* vridhdied into *আ á*. Thus *রন্ধিতে randhite* "to cook" and *রাব rava* "voice" are always pronounced *আন্ধিতে ándhite*, und *আবা á-o* respectively. Sometimes a reverse process takes place and a *র r* is supplied where not required. A good example is *রিবিনিষ রজেজ্ revenue agent*, which is pronounced *রবিনিষ রেজেজ্ iviniu rejent*.

জ l and ন n are interchangeable at pleasure, especially when initial, or forming the last syllable of a word. In some parts of the country the people seem to have lost all power of pronouncing ন unassisted by a subsequent conjunct letter. Thus বানারুল *báná-ila*, "he made" may become বালান *bálana* or বালাল *bálála* or বানাল *bánála*. লক্ষীপুর *Lakshmípara* becomes নখিপুর *Nakhipur*.

(3.) Aspirated are interchanged with unaspirated letters, and *vice versa*. Thus দৈবকিনী *Daivakini* is also pronounced দৈবখিলী or দৈবখিনী *Daivakhilí* or *Daivakhiní*.

Similarly যে *je* and জে *jhe*, who. গর্ভ *garbha* and গর্বা *garba*, a womb. বাধা *bádhá* and বাদা *bádá*, hindrance. বোঝা and বোজা *bojhá* and *bojá*, a burden. বেনা and বিনা *bhená* and *viná*, looking away.

(4.) The vowels ই *i*, ঈ *í*, and এ *e*, are freely interchangeable. For examples, see above.

(5.) With regard to other letters—

(a.) অ *a* can take almost any vowel sound, except that of *a* in "America." As an extreme instance I give কারিয়া *kariyá*, which is pronounced কৈরে *kaire* or rather *koire*, having done.

(b.) ই *i* is frequently omitted, the consonants on each side forming a conjunct. Thus, বান্ধিতে or বান্ধিতে, *bándhite* or *bándhte*. It is also sometimes inserted between the members of conjuncts.

(c.) Single medial surd letters are elided optionally. Especially ক *kh*, also ব *b*, ভ *v*, and য *y*.

E. g., সা *sa-i* for সখি *sakhi*, দে *de-o* for দেব *deva*, পি *pia* for প্রিয় *priya*. Compare *Vararuchi*, II. 2.

(d.) চ *chh* is always pronounced as a dental স *s*. আছে *áchhe*, is, becomes আচে *áse*. Compare *Vara.*, II. 41, for a reverse example.

(e.) স *s* is never pronounced as a dental, but always as শ *sh*, the reverse of *Vara.* II, 43.

(f.) জ *j* and য *y* are often pronounced as *z*, and this not only in Arabic and Persian words, but in such words as যন *zan*, when, for যখন *jakhán*.

(g.) Similarly ফ *ph* sometimes becomes *f*.

(h.) ব *b* sometimes becomes ম *m*. For example see the verb paradigms.

(i.) As in ordinary Bengali, র *r*, and ব *v* interchange with জ *j* and ঞ *b* respectively. র *r* also interchanges with ড *ḍ*.

(6.) Conjuncts. I know of no rule under which these can be brought. They are made and decomposed *ad libitum*. য় *y* and ব *v* at the end of a compound are pronounced as in ordinary Bengali. র *r* at the end of a compound is generally detached, as in পরান *parán* for প্রাণ *prāṇa*. *Vara.*, III. 62. Sometimes, however, it is dropped, as in পি *pia* for প্রিয় *priya*. Compare *Vara.* III. 3. At the commencement of a compound it has little effect beyond strengthening the letter underneath. *E. g.* পুষ্কারিনী *pushkariní*

a tank, becomes पुष्काणी *pushkāṇī*, which is pronounced almost like *pushkāṇī*. *Vara*. III. 50.

A noticeable exception to the rule of separation is the preposition प्रति *prati*, which becomes पति; see *Vara*. II. 7, and *Hema-Ochandra's sūtra Pratyādaṁ daḥ* according to which the *prākṛit* form is *paḍi*, and not *pati*. Also, as regards the elision of र *r*, see *Vara*. III. 8. Other compounds can only be settled by comparison and selection.

NOUNS.

The following are the terminations, in the declension of nouns :—

<i>Singular.</i>		<i>Plural.</i>
Nominative	— or ए	रा, गुला
Objective }	आक, क	गुलाक
Dative }		
Instrumental	जाताग्र	गुला जाताग्र
Ablative	थने, ठाँइ	गुलाथने, गुलाठाँइ
Genitive	र	गुलार
Locative	त	गुलान

Thus बालक a boy is declined—

Nom.	बालक or बालके
Obj.	बालकोक or बालकक
Inst.	बालक जाताग्र
Abl.	बालकथने or बालकठाँइ
Gen.	बालकर
Loc.	बालकत
	and similarly in the plural, बालक गुला, &c.

ADJECTIVES.

These call for no remarks. They are without gender or inflection, except when used as substantives.

PRONOUNS.

As might be expected, their forms are many for each person. The most common are as follows:

First person	मर, मर, नोँ, हामि, आमि, हमरा.
Second ditto	तुइ, तर, तोँ, तुमि.
Third ditto	ई <i>this</i> वो, <i>this</i> or <i>that</i> . ताँ or तेँ or ताँजि <i>that</i> or <i>he</i> .
Relative	थो, or थोँइ or थोँजि, <i>who</i> .
Interrogative	कोँ, or कोँइ or कोँजि, <i>who</i> ?

Samples of Declension.

Nom.	मैं	I	हामि or हामरा
Obj.	मैंक, मोंके	me	हामाक, हामाके
Inst.	मोंर हाताइ	by me	हामार हाताइ
Abl.	मोंर बने, or ठाँर	from me	हामार बने or ठाँर
Gen.	मोंर	of me	हामार
Loc.	मोंत	in me	हामात

Similarly are declined तौ *you*, तौ *that*, याँ *who*, &c.

इँ, *this*, is declined as follows :

इँ, इँमाक, इँमार हाताइ, &c.

The plurals of all these words follow the analogy of substantives.

The two most interesting forms amongst the above, to my mind, are हामि and हामरा. The first is the missing link between the Bengali हामि and the Hindi हम, both of which are plural honorific forms. हामरा is interesting as showing the process by which in almost every language, plural honorific forms supersede the usual singular. हामरा is the plural of हामि, which is itself a plural form. हामि, however, by constant use has acquired a purely singular sense, and thereby ceases to be honorific, and a fresh plural of a plural has to be coined to supply the deficiency. I may mention that तामरा is also used in a similar singular sense for "*you*" in the north-west of the District.

Another point worth noting amongst these pronouns, is the characteristic ending in आँर, जाँ, or आँइ, which are all local variations of the same sound. This is the characteristic ending of most of the *sarva-namām*, mistranslated "*pronouns*." Thus we have सखाँय not सख meaning "*all*."

It is worth enquiring into, how numerals in so many languages came to have not only original Aryan pronominal inflexions, but pronominal terminations showing the most manifest signs of, and being the result of modern phonetic decay. Such an enquiry, however, would necessitate discussing the whole theory of pronominal declension, a task which I willingly leave to more competent hands. What I have set myself to do is to record facts, and to leave others to draw inferences from them.

I here give specimens I have collected of the commonest pronominal forms, in the form of a "Philological Harp."

PRONOUN.	PLACE.	TIME.	MANNER.	QUANTITY.
Determinative.				
<i>this</i>	<i>hither</i>	<i>now</i>	<i>thus</i>	<i>this much</i>
इं, एंइ, एंइना, हेंइ- ना, एंइ,	इत्ति, एत्ति, एटे, एटे, एइटे <i>here</i> हिट्ति, हेत्ति, हेटे, हेइटे,	एला, एख्ने, हे- ख्ने, एवेला	एदान्, एइदान्, हेदान्, हेसन	एत, हेत.
Demonstrative.				
<i>that</i>	<i>thither</i>	<i>then</i>	<i>in that way</i>	<i>that much</i>
तां, तांय, तांजि, ओ, ओइं, ओकेना.	उत्ति, वत्ति, खेटे, खेटे, खोइटे, <i>there</i> सित्ति, सेत्ति, उत्ति,	सेला, सेखन्, ओ- वेला	ऐदान्, सेदान्, खोदान्, सेसन,	यत, तत, सेत,
Relative.				
<i>who</i>	<i>whither</i>	<i>when</i>	<i>how</i>	<i>how much</i>
यां, यांइ, यांजि, भांइ.	<i>and</i> <i>where</i> यित्ति, येत्ति, यत्ति, येटे.	येला, भेला	येदान्, येसन, भेदान्, भेसन	यत, भत.
Interrogative.				
<i>who?</i>	<i>whither?</i>	<i>when?</i>	<i>how?</i>	<i>how much?</i>
कां, कांय, कांइ, कांजि	<i>and</i> <i>where?</i> कुत्ति, कोटे	कोन्वेला, कोन्- सम	केदान्, केसन,	कत. .

VERBAL FORMS.

Prefatory. As will be seen the main scheme of the Rangpurī conjugation is founded on that of classical Bangālī. To bring this out more clearly, I shall give the two paradigms in parallel columns. As usual in local dialects, the° so called non-honorific or, in reality, singular form, is preferred to the honorific plural form usually found in the books.

In book-Bangālī there are few irregular verbs. The two commonest examples are *यायोन* *to go*, and *याइन* *to be*. The former has its past participle *गिया* and *गेल* instead of *याइया* and *याइले*, and the latter has its Imperfect tense *हिलास* instead of *याहिलास*. The regular forms are, however, sometimes used in poetry, and I have remarked that the peasantry of Bard-

wán and the neighbouring districts occasionally use those of चाबोन in conversation. In the northern half, however, of Rangpur the regular forms are the rule and the irregular the exception. Indeed in conversation, काबिनु and not बिनु is always used.

PARADIGM.

The verb पेडान् to strike.

*Book form**Rangpur form.**Present.*

1st person पेडाइ I or we strike

पेडाचौं

2nd „ पेडाइस्

पेडाइस्

3rd „ पेडाइ

पेडाइ

Present Definite.

1st „ पेडाइतेहि I am or we are striking

पेडाइतेचौं

2nd „ पेडाइतेहिस्

पेडाइतेहिस्

3rd „ पेडाइतेहे

पेडाइतेहे

Imperfect.

1st „ पेडाइलाम् I or we struck

पडानु

2nd „ पेडाइलि

पेडाइले or पेडाइलु

3rd „ पेडाइल

पेडाइल

Imperfect Definite.

1st „ पेडाइतेहिलाम् I was or we were striking

पेडाइवार नागिचिनु or पेडाइतेचिनु

2nd „ पेडाइतेहिस्

पेडाइतेचिस्

3rd „ पेडाइतेहे

पेडाइतेचि

Perfect.

1st „ पेडाइयाहि I or we have struck

पेडाइचौं

2nd „ पेडाइयाहिस्

पेडाइचिस्

3rd „ पेडाइयाहे

पेडाइचे

Pluperfect.

1st „ पेडाइयाहिलाम् I or we had struck

पेडाइचिनु

2nd „ पेडाइयाहिस्

पेडाइचिस्

3rd „ पेडाइयाहे

पेडाइचि

Aorist and Conditional.

1st „ पेडाइताम् I or we used to strike or should strike

पेडाइताम्

2nd „ पेडाइति

पेडाइते

3rd „ पेडाइत

पेडाइत

Future.

1st Pers.	पेटाईव <i>I or we shall strike</i>	पेटाईम or पेटाईसु or पेटाई
2nd "	पेटाईनि	पेटावु
3rd "	पेटाईवे	पेटाईवे

Imperative.

1st "	पेटाई <i>Let me or us strike</i>	पेटाई
2nd "	पेटा	पेटा or पेटाओ
3rd "	पेटाउक	पेटाउक

INFINITIVE AND PRESENT PARTICIPLE.

पेटाईते	<i>To strike or striking</i>	पेटाईते
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VERBAL NOUN.

पटान	<i>a striking</i>	पेटान
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CONJUNCTIVE PAST PARTICIPLE.

पेटाईया	<i>having struck</i>	पेटाया &c., &c.
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ADVERBIAL PAST PARTICIPLE.

पेटाईले	<i>having struck</i>	पेटाईने
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GERUND.

पेटाईवा	<i>striking</i>	पेटाईवा
पेटाईवाके	&c.,	पेटाईवाक
&c.		&c.

Inceptives and potentials are formed by the genitive of the gerund, and not by the infinitive, with नागन and पारण respectively. Thus पेटाईवार नागै *I begin to strike*. पेटाईवार पारै *I can strike*.

With reference to the above Rangpurī forms, I would mention that in the course of my reading I have met many of them in plays, in the conversation of persons who are not supposed to inhabit Rangpur. I do not for a moment pretend either that the forms I have given are all necessarily peculiar to Rangpur, or that I have by any means suggested all the possible varieties. I have only given the forms usually current amongst the lower orders of the District.

OTHER MISCELLANEOUS GRAMMATICAL FORMS.

I have already shown one point of resemblance between Rangpurī and Hindī in the word "I" जामि.

There is another form of the genitive, which may, I believe, be connected with the well-known Hindī suffixes का, के, and की, signifying "of." It is met in the books, or rather in the grammars, in the genitive of आपनि

"*your honour*" आपनकार, meaning "*of your honour*," while आपनार means "*of one's self*." This is exactly reversed in Rangpurī, where आपनकार is almost always used when the speaker wishes to say "*of one's self*." In this dialect, however, the suffix कार, which I believe to be a sort of double genitive, is not confined to आपनकार. I find it used in common conversation, in such phrases as डुर दिन कार राखी हँटे रनू "I came on foot a journey of two days"; काह कार अन्य खुषो "put it aside for to-morrow." Curiously enough, when in Tirhut in the year of the famine, I was thrown much amongst uneducated classes, I noticed, amongst other forms in which a relationship to Bangālī might be traced, a similar use of the word कार and instead of का, which then not having been in Rangpur, I could not understand.

I now proceed to give some examples of Rangpurī folk songs.

I have used the Deva-Nāgarī alphabet, and not the Bangālī, as I believe they will thus be accessible to a wider number of readers. As the three sibilants are freely interchangeable, I have for the sake of uniformity followed *Vararuchi* II, 43, and have written a dental स sa throughout. I have not, however, been able to carry out this rule rigidly in the case of some compound letters. For similar reasons I have represented both ष् and ष by ष.

The first story is a kind of nonsense verse, not unlike some of our nursery rhymes at home. Although I do not know any exact European parallel, it is quite possible that such an one may exist, and I have given it in the hope of the analogy being pointed out.

I do not know why it is called a *Gorakh Nāther gān*. It appears to have no connection whatever with Kṛishṇa. It is a great favourite amongst the people, who delight in hearing it sung, and go into fits of laughter at the absurder impossibilities related.

गोरख नाथेर गान ।

काने काने कथा कथु ।
 तिन गँधो तार रहस्य पाग्र ॥ १ ॥
 डुर गँधो तो भांगा चुरा ।
 एक गँधो तो मानुसे नार ॥ २ ॥
 ये गँधो खानत मानुस नार ।
 ताते वसिष्ठ तिन जन कामार ।
 डुर जन तो जाने ना ।
 एक जन तो बनाव्र ना ॥ ३ ॥
 ये कामार डा बनाव्र ना ।

खेद बाल्लाने तिन खान कोदारल ।
 दुइ खान तो भांग चुरा ।
 एक खानत तो मुड़ा नार ॥ ४ ॥
 ये खान कोदारलेर मुड़ा नार ।
 ताके दिया खुरिने तिन ठा पुष्कसिं ।
 दुइ ठा तो धुला धुसर ।
 एक ठा तो जले नार ॥ ५ ॥
 ये पुष्कसिंते जल नार ।
 ताते मामादने तिन खान जाल ।
 दुइ खान तो फारा हिरा ।
 एक खान तो घोष नार ॥ ६ ॥
 ये जाल खानेर घोष नार ।
 ताके दिया मारिने तिन ठा बइ ।
 दुइ ठा तो भापेया गेन ।
 एक ठा तो पाइने ना ॥ ७ ॥
 ये बइ ठा पाइने ना ।
 ताके निया गेन कालीगञ्जेर चाड ।
 ताके विक्रि करिने तिन काहन कारि ।
 दुइ काहन तो पाइने ना ।
 एक काहन तो दिने ना ॥ ८ ॥
 ये काहन कारि दिने ना ।
 ताते किलिने तिन ठा पातिल ।
 दुइ ठा तो भांग चुरा ।
 एक ठा तो तला नार ॥ ९ ॥
 ये पातिल ठार तला नार ।
 ताते खान्दिने तिन जन बामनेर भात ।
 दुइ बामन तो खाइने ना ।
 एक बामन तो पाइने ना ॥ १० ॥
 ये बामन तो पाइने ना ।
 ताके मारिने तिन ठा चखोर ।
 दुइ ठा तो नागिने ना ।
 एक ठा तो चखोराने ना ॥ ११ ॥

इत्यादि ।

A SONG OF GORAKH NATH.

(1.) Let me whisper a tale in your ear. I got a present of three villages.

(2.) But two villages were all waste land, and in the third there was not a single man.

(3.) In the village in which there was not a single man sat three blacksmiths. But two of them did not know their business, and the third did not make anything.

(4.) The blacksmith who made nothing, made three spades. But two of them were broken and good for nothing, and the third had no ferule for the handle.

(5.) With the spade which had no ferule, he dug three tanks. But two of them were filled with dust, and the third had no water in it.

(6.) In the tank which had no water in it, he set three fish-nets. But two were in rags and tatters, and the third had no meshes.

(7.) With the net which had no meshes, he caught three *ru-is* (a kind of fish). But two jumped away and escaped, and the third he could'nt find.

(8.) The *ru-i* he couldn't find, he took off to Kálíganj market, and sold it for three káhans* of *kaorís*. But two káhans he didn't get and one they didn't give him.

(9.) With the káhan of *kaorís* they didn't give him he bought three earthen cooking pots. But two were broken and worthless, and the third had no bottom.

(10.) With the pot which had no bottom, he cooked rice for three bráhmans. But two didn't eat any; and the third didn't get any.

(11.) And the bráhmaṇ who didn't get any, gave him three slaps. But two didn't touch him, and the third wasn't a slap, &c.

The next song is a curious and characteristic production of the tiger-haunted northern half of the district. It tells how the Tiger-god *Sonáráy Thákur* destroyed an army of Mughuls.

व्याघ्रेर देवता

सोनाराय ठाकुरेर गान ।

बाघे सब नाम लहये डाके रे,
 सो ठाकुर सोनाराय, बाघ सब डाके
 बाड़ी ९ बेड़ाय ठाकुर हरि नाम दिना ॥

* A *ganḍa* = 4. 20 *ganḍas* = 1 *paṇ*. 16 *paṇs* = one káhan = 1280.

चरिर नाम दिना ठाकुर चलिना पये यात्र ।	
यत भोगलेर फाज घाटात नागल पात्र ॥	९
यत भोगलेर फौज जिज्ञासिले कथा ।	
मनेर गौरवे ठाकुर दोगदोगले माथा ॥	१
कमरेर पठिका खसा । ठाकुरके वान्निना ।	
धाकाइते ९ नैले आगत करिना ॥	४
धाकाइते धाकाइते नैले कोठ सालेर घरे ।	
बाइस मोन पाथर दिले तार बुकेर उपरे ॥	५
शेठ मगल उठे वले वड़ मगल भाइ ।	
कालिकार बन्धन दादा चल देखिते याइ ॥	६
तोनाजिल मगल जाति करिल ज्ञान ।	७
मिठा जले मगल जाति करिले भोजन ।	
बन्धन देखिते मगल करिल गमन ॥	८
कतेक दुर झाड़ि मगल कतेक दुर यात्र ।	
आर कतक दुर गेले कोठ सालेर लागल पात्र ॥	९
कोठ सालेर घरे याइले मगल भुलकी मेरे यात्र ।	
बाइस मोन फेलाइला तेमार नाइ सोनारात्र ॥	१०
शेठ मगल उठे वले वड़ मगल भाइ ।	
ए बन्धन भाल नय दादा चल वाड़ी याइ ॥	११
वाड़ी याइना वान्नि आमरा सात खानि घर ।	
से घरे थाकिले वाघक नाइ डर ॥	१२
चिनिवार ना पारिली वेठा मगल झाड़ि जाति ।	
तेर मगल मेरे यात्र निसा भाल राति ॥	१३
अरनेर किनारे ठाकुर मारे हाक ।	
एक ठेलाय चलिना आसिल विसा स एक वाघ ॥	१४
विसा सय वाघ आसिल तिसा सय जठ ।	
चेठ मुख इइले आसिल वनेर भाजुक ॥	१५
घर ९ वाघगन वाठार पान खाया ।	
ए ९ वेठा मगलेर साते वाइ साधिया देखे ॥	१६
एतेक ऊड़मुड़ि वाघ उठिल निल पान ।	
गात्रेर ठेलाय भाइले फेलाय घरसात खान ॥	१७
घर भाजिया वाघ इइल कातर ।	
नम्प दिना सन्नाइल वाघ वाड़ीर भितर ॥	१८
मगलेर भाइले गिछे अन्नसालेर घरे ।	
नागल पाइना मोलकाइल वाइ ऊड़मुड़ि वाघे ॥	१९
मगलेर वेठि गिछे जल भरिवार ।	
वाघक देखिना तार नदी सातरिना यात्र ॥	२०
मत्स्य वले तार चड़ीनाले यात्र ।	
आजि केन वा ठाकुर मोक एन ताप देइ ॥	२१

बाम हस्ते धरि भोगलक मारे एक पाक ।	
माडित पड़िया भोगल करे बाप १ ॥	२९
आजि केन वा ठाकुर मोक एत ताप देख ।	
घनेर किङ्कर ना सुद मनेर किङ्कर ।	
चङ्कनेर घोड़ा बेचे सेवा करिम तोर ॥	२९
सद दिन सोनाराय ठाकुर दिखे गेल देखा ।	
नर लोक पुजे ताक पाइया परिखा ॥	२४
इति ॥	

A SONG OF SONARÁY THÁKUR.

All the tigers roar forth his name.

"Oh Thákúr Sonáráy." All the tigers roar forth his name.

(1.) From house to house the Thákúr wandered, uttering the name of Hari.

(2.) He uttered the name of Hari as he went along the way ; and he met the whole Mughul army on the road.

(3.) The whole Mughul army asked him a question : but in the pride of his heart, the Thákúr only shook his head.

(4.) So they undid their waistbands and tied up the Thákúr, and with blows they thrust him on before them.

(5.) They thrust him on into their prison, and tied a twenty-two maund stone upon his chest : (and left him there).

(6.) The little Mughuls got up and said to the big Mughuls, "Brothers, come, let us see our prisoner* of yesterday."

(7.) Both the classes of Mughuls went to bathe.

(8.) They ate their breakfast (and drank) sweet water, and then went off to see their prisoner.

(9.) The Mughuls went on, and on, and on, and arrived at the prison.

(10.) When they arrived at the prison, they peeped carefully in. "He has thrown off the twenty-two maund stone, your Sonáráy is not there."

(11.) The little Mughuls got up and said to the big Mughuls, "Brothers, this binding up was not good. Let us go home.

(12.) "Let us go home and build seven houses.* If we keep inside them, there will be no fear of the tiger."

(13.) (The Thákúr said unto himself) "Ye scoundrels, low-caste Mughuls, ye could not recognize me. Your Mughuls will be killed one fine night.

* Lit. "tying up."

(14.) The Thákur went to the edge of the wood and gave forth a roar, and with one bound there came twenty hundred tigers.

(15.) Twenty hundred tigers came, thirty hundred camels, and with heads down came wild bears.

(16.) "Hurrah, Tigers ; take some betel and *pán*. We have revenge to take upon those scoundrelly Mughuls.

(17.) The tigers rushed up tumultuously and took the *pán* : and with one spring of their bodies they destroyed the seven houses.

(18.) The tigers got tired with breaking down the houses, so they jumped into the inner apartments.

(19.) The Mughul's wife had gone into the cook-house. When the tigers saw her, they tumultuously twisted her neck.

(20.) The Mughul's daughter had gone to fetch water. When she saw the tigers, she jumped into the river and began to swim. The fishes said "A crocodile is eating her."

(21.) She said, "Oh Thákur, why are you afflicting me so to-day."

(22.) He caught the Mughul by the left arm, and gave him a blow. The Mughul fell on the ground crying "Báp, Báp."

(23.) He said, "Oh Thákur, why are you afflicting me so to-day. I'm not a slave of my wealth but I am of my life. I'll sell my riding horse and be your slave."

(24.) On that day Sónaráy Thákur made himself visible, and men now worship him when they fall into temptation.

The third specimen is a song describing the birth of Krishna. It is by far the most popular song amongst the Hindus of the district. It is not extant complete, but I have been able to collect many pieces of it and to repatch them into something like the original song which no doubt originally existed. I have been able to produce a pretty fair text ; as there is hardly a line of which I have not obtained two or three copies. Considering the great distances from each other at which the places were whence I obtained the fragments, it is wonderful how they agree ; especially as it is not customary for the reciters to possess written copies, or even to be able to read them if they did. Bábu Hariś Chandra Rái of Ulipur in this district was able to give me three extensive fragments, which were of great assistance to me. They gave me, in fact, the main thread on which to string the other smaller fragments I had collected.

No doubt the story was originally continued further than I now give. In fact, I have some short pieces on Krishna's later life which favour such a theory : but unfortunately they are not nearly numerous enough, as far as I have yet been able to see, to justify me in giving any more at present.

As it is given here, the story ends abruptly. Perhaps, at some future time I may be able to extract more of the same kind of gold from the rich mine of material yet lying by me unexamined.

किष्टेर जन्माष्टमी ।

उपसेन महाराजा तिरिजगते जानि ।	
तार घरत् उवजील कन्या नाम देवखिनी ॥	१
कार घरत् दिमो कन्या योग्य नाइ वर ।	
रप आबे रतन आबे परम सुन्दर ॥	२
चेन् काले खलिया आइल नारद मुनिवर ॥	३
मुनिक् देखिआ राजा करिल सभासन ।	
बसिवार दिल मुनिक् उत्तम सिंहासन ॥	४
पांथो घोवार आनिया दिल भाङ्गित करि जल ।	
कपूर ताम्बुल दिल मीठा भरि पान ।	
राजा कैल भाल् जैल मुनि ठाकुर इति आगमन ॥	५
भोर घरे बाङ्गे कन्या नामे देवखिनी ।	
रपे गुने बाङ्गे कन्या परम सुन्दर ।	
कोन खाने दिस विवा जुम्य ना पाइ वर ॥	६
जेन काले गुनिया कैल नारद मुनि वर ।	
गाकुल मजरे आबे वासु देवेर घड़ ।	
सेइ खाने देखो विवा देवक सुन्दर ॥	७
देवखिनी वासुदेव उइ सम सब ।	
सेइ खाने देखो विवा देवक सुन्दर ॥	८
ताक मुनिया देवक राजा हरसित जैया	
नारदक पाठारया दिया वसुदेवक आनिल धरिया	९
नाना राज्येर राजाक खाने सभासिया ।	
रो-भाट ब्राह्मन् तारा आसिलि विस्तर ॥	१०
चारि गच्छि राम कछा आङ्गनाथ गाढ़िया ।	
सेनार घट चाइलन वाति दिया लइल बरिया ।	
आठेर लगन चाइर करिया देवखिनी विवा ॥	११
वसुदेव देवखिनीक शुद्धा एकस्तर ।	
मानामत करे दान राज राखेसर ।	१२
हलि घोड़ा दान यतेक किङ्ग कर ॥	१३
धनमेते करे दान कन्यार हय माथो ।	
तेसे करिले दान एक सत्त माथो ॥	१४
ताइ पाइत करे दान कन्यार हय भाइ ।	
तेइसे करिले दान एक सत्त माइ ॥	१५

तां पाहत करे दान कन्यार हय जेठा ।	
एकठा गभी करिले दान तारथो नेदु छाठ ॥	१५
तार पाहत करे दान कन्यार हय जेठा ।	
तैसे करिले दान चरका काठा नाठा ॥	१६
तार पाहत करे दान कन्यार हय आजु ।	
दान नार दक्षिना नार आलि हाकु दाकु ॥	१७
तार पाहत करे दान कन्यार हय मामा ।	
तैसे करिले दान भाजा गारनेर सभा ॥	१८
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२२ वामन = ब्राह्मण, तिरि = स्त्री । २३ वचर = वचर । २६ सिमाने = खाने ।
 २८ परमाद = प्रमाद । ३० ऐरी = वैरी ।

ए पारतु खान करे सत्येर दैवखनि ।

ओ पारे खान करे यसेदा रोखनि ॥

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२५ परानेर = प्राणेर । ४१ पुर्नवान = पुण्यवान । ४५ काखर = कखेर ।

४८ पातर = पात्र, साखर = शाख ।

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THE BIRTH OF KRISHNA.

1. Ugrasena was a great king, renowned throughout the three worlds; and in his family was born a damsel named Devakí.

2. "Into what house will I give the damsel? I cannot find a worthy suitor. She hath beauty and she hath jewels. She is fair to look upon."

3. About this time the most excellent saint Nárada came on a visit to her father.

4. When the king saw the saint, he made obeisance and gave him a splendid throne to sit upon.

5. They brought water in a vessel for him to wash his feet, and also gave him camphor and betel and pán of the kind known as *míṭha bhari*. Then the king said, "Thy arrival here, Reverend Sir, is propitious.

6. "In my house there is growing up a damsel named Devakí. She is growing both in beauty and in virtue, and is exceedingly fair to look upon. Where shall I give her in marriage? I cannot find a worthy suitor."

7. Nárada thereupon proceeded to make astrological calculations, and then said to the king, "In the city of Gokula is the house of Vasudeva. There give thou thy daughter Devakí in marriage.

8. "Devakí and Vasudeva are a perfect match for each other. In his house give thou her in marriage."

9. On hearing these words, king Devaká was pleased, and despatched Nárada with an invitation to king Vasudeva.

10. He also invited with great honours the kings of the various (neighbouring) countries; the *Ro-bhát* Bráhmans came in crowds.

11. They planted four Rám plantains in the court-yard (for the marriage seat). They filled the house with golden offering dishes and lamps with shades,* and they shortened the eight days preparatory ceremonies of Devakí's marriage to four days.

12. They set Vasudeva and Devakí sitting together, and the kings of

* *Lit.* Lamps which can be carried about.

the earth began to make presents of horses and elephants, each to the best of his ability.

13. First the mother of the bride made her present. She gave them a hundred ships.

14. After her the bride's brother made his present of a hundred cows.

15. After him her father's eldest brother made his present. He gave only one cow, and it had a short tail.

16. After him his wife made her present. She gave the reel of a spinning wheel.

17. After her the bride's grandparents made their present. But they gave no present and no offering; they gave nought but hurry and bustle.

18. After them the bride's maternal uncle made his present. He gave the iron ferule of a broken rice pestle.

19. At this stage of the proceedings the excellent saint, after making astrological calculations, said "Oh Kamsa, I see thy death in the womb of Devakí."

20. On hearing these words, King Kamsa became extremely sorrowful in heart. He took his sword in his hand and would have slain Devakí.

21. But five or six kings caught hold of him and held him back, while the reverend saint came up to him, and remarked as follows:

22. "Slaughter of a cow or of a Brāhman may be expiated by gifts, but he who slayeth a woman, with him travelleth his sin."

• 23. Devakí and Vasudeva went to Gokula, and there each year she had a child to the number of seven.

24. At each birth Vasudeva worshipped Kṛishṇa, and finally Kṛishṇa took up his abode in Devakí's womb.

25. At the end of the month, on a moonlight night, Devakí showed signs of pregnancy.

26. She took *gilí* fruit and *ámli* fruit and went to bathe; and on the way Holy Hari made himself visible to her in his full form.

27. "Oh Devakí, sweet Devakí, I ask for a little place within thy womb."

28. Devakí said, "To-day what dismay is mine. On all sides I see nought but a terrible darkness.

29. "The sun is hot, and the way seemeth long. I know not what God addresseth me from the sky."

30. "Fear not, Devakí, my gentle mother. I will kill for thee thy enemy—I the Holy Hari.

31. "One day, within the limits of a single night, I will protect thee

from the Club-bearer. I will slay the king with all his family. Truly a valiant act.

32. "The king will die saying, 'I am killed'. That I can prophesy. I will kill Kamsa the Asura. Short will be the time it will take me."

33. Again on another occasion Devakī went to bathe, and in the form of dust the Holy Hari entered into her womb.

34. On this side of the river bathed the chaste Devakī. On the other side bathed Yaśodā and Rohinī.

YAŚODĀ SPEAKS.

35. "Friend, Friend, Friend of my soul, I say unto thee, did not the Yamuna flow between us, I would clasp thee in my arms."

36. When the river Yamunā heard these words, he left the sands of his bed, and the two friends embraced each other where the water had just been flowing.

YAŚODĀ SPEAKS.

37. "Friend, Friend, Friend of my soul Friend, I say unto thee a word. How many days and how many months art thou with child?"

38. When Devakī heard these words, she began to weep. "What, dost thou my friend not know? My brother is my foe.

39. "On seven days hath he sent seven children of mine to Yama's abode. Other women remain pregnant for ten months and ten days, but I have been a year with child."

YAŚODĀ SPEAKS.

40. "Friend, Friend, Friend of my soul, hear the vow I make unto thee.

41. "If a holy daughter is born unto me, and if thou hast a son, do thou give him unto me." The two friends thereupon swore to observe this promise.

42. "One vow, two vows, the third time a vow. If this vow is broken, may evil befall us." The two friends thereupon swore to observe the promise.

43. Up to her knees in water Devakī purified herself, and up to her breast in water she dipped herself five times.

44. At a bad *ghāṭ* she dived, but it was at a good *ghāṭ* that she arose from the water.*

45. The two friends exchanged their wet clothes for dry, and each lifted a water jar on to her hip, and went to her own house.

* That is, Kṛṣṇa entered into her during the dive.

46. After concluding her bath, Devakī went home to her palace, and day by day, her body and limbs waxed in size.

47. At this time the startled goblins of the night, the Asuras, came and wandered through every house and palace, and thus the scouts of King Kamsa approached his presence chamber.

48. On his five sides, the king had five servants round him. The Sheriff and the Prime Minister and forty-two books of law.

49. They played upon brazen and copper gongs and gonglets and clarionets. There is no counting the number of war trumpets and cymbals.

50. The King said, "Oh musicians, cease playing. Let the scout tell the news he brings."

51. The scout folded his hands and made obeisance. "Your humble club-bearer hath seen that Devakī is pregnant."

52. When King Kamsa heard these words, he was as it were thunder-struck. He bent his head and did not utter a word.

53. Early in the morning, the King bathed himself with water and sat down in the hall of audience with his five servants.

54. The King said, "My servants, by what device can I escape? Hari hath taken birth to destroy me."

55. The Sheriff and the Prime Minister said, "Oh King build a fort of iron. Environ it with elephants, horses, men-at-arms, and an army.

56. "As long as that exists, no one's father wilt thou fear." The servants then proceeded, "Oh King thou feelest fear within thy soul.

57. "Take thy sister Devakī and fasten her up. When this child is born, we will send it to Yama's house."

58. Kamsa on hearing this was pleased in mind, and called several times for his scouts; and while he was yet calling, they made their appearance.

59. A scout clasped his hands and made obeisance. "Wherefore hath Your Majesty summoned us?"

60. The king addressed that scout with expressive eyes. "Go, oh scout, to Gokula."

61. One order of the king was as good as two to the scout. He took his spear and spear-head into his hand and ran by the shortest way.

62. As he ran, the scout did not even stop to tie up his hair. He went straight to, and entered, the city of Gokula.

63. The scout arrived at Gokula and swore an oath. (He said to Vasudeva) "The King's council is assembled and ill it bode th thee. Vasudeva and Devakī, ye will have to cross the Yamuna."

64. The Holy Krishna then addressed them with a sweet voice, "Give the scout sweetmeats and water to eat."

65. The scout ate sweetmeats and water (to satiety), and left some uneaten, and then he placed Vasudeva and Devakí before him, and produced them in the King's council.

66. With hands clasped Vasudeva made obeisance, saying, "Wherefore hath the great king summoned me?"

67. The King said, "Oh Vasudeva, Nárada, the saint of old, hath told me time on time, that my death lieth in the hands of my sister's children.

68. "Ye two shall remain prisoners in my fort, and when thy child cometh into existence, I will send him to Yáma's abode." But Devakí, when she heard these words began to weep.

DEVAKÍ SPAKE.

69. "My Brother, I have lost my second self. Thou hast not let one single daughter of mine remain before thee. Brother, may thy horses and thy elephants die, and may thy wife become a widow; may thy págarí fall of itself from off thy head."

70. King Kamsa said to the scout, "(Why art thou standing idle?) Art thou looking for thy father's head. Thrust Devakí into the fort."

71. Devakí said, "Who speaketh these words to me, evil and yet good."

72. The scout arose and spake, "Vasudeva is thy husband. Thou art the sister of the king. Who shall speak ill of thee?"

73. Then they bound Vasudeva and Devakí, and instantly made preparations.

74. And with eighty maunds of iron they built a fort. Outside, it was closed and over it an iron net.

75. Weeping Devakí laid herself down to sleep, and sitting by her head Náráyana showed himself to her in a dream.

76. "Why, my mother, why do ye both weep? In thy womb the lord Náráyana hath taken up his abode.

77. "One day, within the limits of a single night, will I protect thee from the Club-bearer. I will slay the king with all his family. Truly a valiant act."

78. "I have determined to be born in Gokula. All the gods from Indra downwards will attend at the ceremony." Then Devakí awoke from sleep.

79. "Awake,* awake my lord, the crown* of my head. This night, just before dawn I dreamt a dream. Náráyana hath taken up his abode in my womb.

80. "'I have determined to be born in Gokula,' saying these words he left me and went to heaven."

* Literally "umbrella."

81. Kṛiṣṇa summoned the gods urgently, and they came, and made obeisance to him with hands clasped, "Wherefore, Oh Mighty Lord, hast thou summoned us?"

KṚIṢṢA SPAKE.

82. "I have determined to be born in Gokula. Come ye all, and raise a storm of wind and rain. Hear ye now, oh gods, my resolution."

83. They took fifty-two times sixteen scores of winds and clothed themselves in them. Śilāvātī was dressed in forty times sixteen scores of hail-stones.

84. Indra clothed himself in twelve clouds, and they roared like unto the roar of a lion or of an elephant.

85. For seven nights and nine days the storm raged in Gokula.

86. The clouds poured forth in streams. The hail began to fall like thunder-bolts.

87. Plants and trees were broken. The trees flew about like dust. The *Sṛīphala* tree fell, and the tiger ran away with a broken tail.

88. The scouts of king Kamsa fled and hid themselves under the *māchās** of the householders. The messengers and the archers fled, running at the top of their speed.

89. One messenger fled to where the ploughmen were. He laid aside his sword and shield and took to weeding the field.

90. Another scout ran into the house of a woman fresh from child-bed. He took the pūgarī off his head and with it began to cleanse the child.†

91. He said to the wife, "Mother, mother, close the door. Who again will enter (such) service (as mine), may his wife be unto him as his mother.

92. "I would sooner turn a beggar, and support an old father and mother, and break up my sword and shield, and fashion them into scythes and hatchets."

93. As the day has been, so is the night. Devakī hath a child and the neighbours know it not.

94. He is born of a dark complexion, with a garland of wild flowers round his neck. The tune of his nostrils is like the melody of a flute.

95. A pearl coronet on his head, a *Sṛīphala* and a lotus in his hand. On his right standeth Lakshmi, on his left Sarasvatī.

96. He tottereth as he goeth. His feet wear a pair of anklets. Round his neck a glorious golden wreath.

A kind of bamboo divan.

† *Lit.* 'And faeces detergens.'

97. Indra cometh on his elephant Airāvata. Sachi cometh in her chariot of flowers. Mother Earth cutteth his navel string.

98. The Mother saith "My son, my son. Show me the moon-face of my child. Why hath he come into the house of a luckless one?"

99. "Even now Kamsa's scouts invest each house and room. He will dash thee to death upon a stone."

100. In a dark room Kṛishṇa is born, and he shineth pure and radiant as the moon-light. As he issueth from her womb, and falleth upon the ground, he speaketh unto her.

KṚISHṆA SPAKE.

101. "I have dwelt in my mother's womb, and have given her great pain. It is true it is a Sunday, but my mother's face is pale as the Moon.

102. "Speedily my mother, come to Gokula, Kamsa must not escape." But Devakī exclaimed, "Alas!" and struck the pillow with her arm, saying "Who will call me Kṛishṇā's mother?"

103. Every one rejoiced and gave vent to cries of victory. Vidyādhara danced, and Gandharvas sang with joy.

KṚISHṆA SPAKE.

104. "My Father, hear my words. Make me a changeling in the house of Nanda the cow-herd."

VASUDEVA SPAKE.

105. "The first man-at-arms waketh and watcheth with bow and arrows in his hand. My child, when I see trident-bearers watching, my heart faileth me.

106. "Ulmán and Surmán wake and watch, and their voice is mighty. Other staff-bearers and spear-bearers wake and watch in all directions.

107. "My child, shield-bearers wake and watch with shields upon their shoulders. Gun-bearers wake and watch with guns in their hands.

108. "Nepsu the man-at-arms waketh and watcheth behind the palace.

109. "My child, the fort and moat are all awake. Every one is now present. Faithful old servants of King Kamsa wake and watch around.

110. "On the backs of elephants mahants watch. On horseback sit watchmen ready. Eight trumpeters sound bugles night and day.

111. "My child, scholars and teachers alike wake for thee. How, Kṛishṇa, my Son, can I take thee away?"

112. Kṛishṇa heard these words with delight, and began to call for the goddess of sleep: and while he was yet calling, she appeared.

113. With hands clasped the goddess of sleep made obeisance. "Wherefore hath My Lord called me?"

KṚISHṆA SPAKE.

114. "I tell thee Sleep; and pay thou heed unto my words. Cast thou the city of Kamsa into an oblivious sleep."

115. The Goddess of Sleep replied, "Remain at ease," and she let loose *Uhili* and *Kuhili*, her two sleep-slaves.

116. The first man-at-arms fell asleep, in his hand his bow and arrow. The three trident-bearers fell asleep, terrible as they were to look upon.

117. Urmán and Surmán of mighty voice fell asleep; and so did the villain staff-bearers and arm-bearers in all directions.

118. So did the gun-bearers with their guns in their hands, and the shield-bearers with their shields on their shoulders.

119. The fort and moat fell asleep, every one as he had come; so did the old and trusted servants of king Kamsa.

120. The mahauts slept on their elephants and the guards upon their horses. The eight trumpeters also slept.

121. Also all the scholars and teachers fell asleep. One by one the whole capital became inert and senseless.

122. Then Kṛishṇa said unto his Father, "My Father, take me away." And as they got outside the fort, the rain and storm ceased.

123. For the sake of the All-mother of the universe, Mahośvara went in front. Gods and Gandharvas accompanied them, and sandy islands rose in the Yamuna.

124. When Vasudeva saw the Yamuna's waves, he became filled with terror, saying, "How can I cross the river?"

KṚISHṆA SPAKE.

125. "See Father, in front of us even jackals have been able to cross. The water will not reach thy knees. So take me in thy bosom and pass over.

126. "Let not there be fear in thy mind, My Father. I have come into thy house, the fruit of thy many pious deeds. Home thou art of all the virtues. Hear my words and place me in the cow-herd's house.

127. The father took the abode of virtues into his bosom and descended into the water. Holy Kṛishṇa bathed.

128. And Vasudeva searched for Him amidst the waters of the Yamuna.

129. He searched in the water, nor could he find Kṛishṇa. He became sorrowful in heart.

VASUDEVA SPAKE.

130. "Devakí hath wasted away of grief for her seven former children; and now when she heareth of this, she will surely die."

131. The Holy Hari cried to his father, "I am bathing. Wherefore art thou weeping with distracted mind?"

132. "For ten months and ten days was I within my mother's womb. I have not been suckled by her, and I have bathed to purify myself from the taint."

133. He searched in the water and found him. He took him into his bosom saying, "Where are my Friend* and her husband?"†

VASUDEVA SPAKE.

134. ‡"The fruit of many virtuous actions, Kṛishṇa, hath been born in my house. Bring forth and show me thy Mahá Máyá."

NANDA SPAKE.

135. "In my house hath been born a daughter. I have called her Mahá Máyá. In form and virtues is she truly beauteous."

KṚISHṆA SPAKE.

136. "If thou givest one damsel, Oh Nanda, thou wilt give salvation to a thousand generations. Thou shalt see, what I, the Holy Hari, can do for thee."

137. He took the Holy Hari to his bosom, his eyes glistening like two diamonds; and gave in exchange Mahá Máyá.

138. What woman that beareth child hath given place in her womb to one like Him. Or what pangs did Vasudeva suffer as he returned home after exchanging his child.

139. The rain and storm ceaseth and Kamsa's scouts, again surround the house, and send the news to the king by the mouth of a messenger.

140. "A daughter hath been born to thy sister." When the king heareth the news, he hasteneth (to the fort).

141. Forth he draggeth Mahá Máyá. He dasheth her upon a washerman's stone, and forth she riseth in the air in the form of a celestial female.

142. Away flieth Mahá Máyá, and as she goeth she saith, "Hear me, uncle. I say unto thee what concerneth thee.

* Yaśodá,

† Nanda.

‡ We must now suppose that Vasudeva has crossed the Yamuna and has met Nanda, whom he is now addressing. Mahá Máyá is of course Yoga Nidrā, who took birth as the child of Yaśodá.

143. "He who will slay thee, waxeth strong in Gokula. Go forth and see him in the house of Nanda, the cow-herd."

144. When King Kamsa heard these words, he was pleased, and on the spot summoned his scouts.

145. His Prime Minister arose and made reply, "On the ocean at Kálidaha is a friend of thine. On the shores of Kálidaha is the house of Unakuṭi the Nága.

146. "He will smite the child upon the breast. Truly a valiant deed."

The concluding poem is an interesting account of the twelve seasons. It is supposed to be the soliloquy of a woman of the Bedhya caste during the absence of her husband on a peddling tour. The Bedhyas here, as in other districts, have the reputation of being half gipsies, half thieves. Their ostensible means of livelihood is a petty traffic in *hámáku* (a kind of Rangpurí tobacco prepared for chewing), camphor, cloves, and other spices which they sell to women. I have ventured in this case to attempt a metrical paraphrase, instead of a literal translation. The original is so extremely compressed, and so full of allusions to agricultural life, that it would be almost unintelligible without a full commentary.

The piece partakes more of the nature of a Bháná or dramatic monologue (Cf. Wilson's *Theatre of the Hindus*, Vol. II, p. 384), than of any other species of Sanskrit composition with which I am acquainted. The reciter's husband, Nílá Bedhya, has gone on a voyage down the Ganges to the southern regions, where the tide ebbs and flows, and he is absent a whole year. She describes each month how she looks forward to his return, in simple but feeling language. It is a great relief to come to it after the eternal *viraher anala* of the orthodox book-school.

In the month of *Pausha*, she hints that advances have been made to her by some rich neighbour, who offers to make her his *dási*; not at all an uncommon occurrence in this district, where women are bought and sold and stolen like cattle. The arguments used are curious enough, and characteristic. The seducer says, "You had better come to me. You are alone and have no friends. This is the cold month of *Pausha*, and you will surely die. You will have no one to burn your body, and it will be thrown away into the fields to rot. So thick will be the winter mists that even the vultures and the jackals will not see your body to devour it."

In *Mágha* and *Phálguna*, every one who can bear a hand is hard at work in the fields. Jute is being cultivated, and the *a-us dhán*, one of the main food staples of the district, is being planted. The very fishermen are hard at work, building low embankments round the rapidly drying pools, and subse-

quently baling out the water to catch the tiny fish which swarm therein. Thus the only people left at home are the *guru mahás'aya* of the village school, and the pupils who are supposed to be under his care. The latter yield to the temptations of the cool spring season, as school-boys do all over the world, and, relieved of the supervision of the elder branches of the family, run truant and riotous throughout the village. Great is the damage done by them, and great the rage excited amid the elders on their return from their day's work ; and, as no parent can see anything but good in his own offspring, the unfortunate *guru* is made the scapegoat for all the mischief done. The boys certainly have been naughty, but it is equally certain that it is the *mahás'aya's* fault. This forms the subject of the episode related under the month of Phálguna.

In Vaisákha, the wife remembers that there is rejoicing in every home, while she alone is miserable. The *paḍá*, or thatch covering, of the rice-stores of the past year is first broken in this month. While everything is happy, she can do nought but think of her husband, and be tortured by jealous suspicions as to his conduct in the far country.

At the commencement of the rains, when storms are prevalent, and her heart is anxious for the wanderer tossed about amidst the tidal waters of the Sundarbans, the happier women of the village gibe at her and give her false news of the death of her husband.

At the height of the rains, the *Komḍa*, a large fish-eating bird which haunts the banks of the Brahmaputra, utters its loud *tub, tub*, the livelong night. The people say that it is a ghost who is speaking, and every one considers it an omen of ill-luck when he hears it.

In Bhádra, the Tál fruits ripen and fall to the ground. They lie there, and apparently decay, but if opened even after many days, they will be found to contain a clear transparent kernel of great delicacy. The wife is led to compare this wonderful power of retaining its beauty and freshness, with her own comeliness, and to fear that before Nílá returns, she may be an old and haggard woman.

The rest of the monologue, I hope, explains itself, and so I introduce it without further preface.

नीलार वारमासि गान ।

॥ अमहायन ॥

ररत अमहायन साने खेते पाका घान ।

केच काटे केच माङ्गे केच करे नवान ॥

करक करक नवान दिया गाविर दुइ ।

घरे नार अभागीर पति नवानेर किना दुख ॥

एइ मास भौङ्गानु नीला ना पुरिल आस ।
 हांसिते खेलिते आइल सक्खे पौस मास ॥ १

॥ पौष ॥

एइत पौस मासे पुखे अन्धकार ।
 मैले मांस ना खाइवे सकुन खगल ॥ ४
 नाखाइले १ मांस चाङ्गे पावे माठी ।
 तबु ना जैव आमि पर पुबसेर दासी ॥ ५
 एइ मास भौङ्गानु नीला ना पुरिल आस ।
 हांसिते खेलिते आइल सक्खे माघ मास ॥ ६

॥ माघ ॥

एइत माघ मासे गरले चाङ्गे सित ।
 तुलार छोड्नुन, तुलार पाड्नुन, तुलार सिधुरर वालिस ॥ ७
 एइत मास भौङ्गानु नीला ना पुरिल आस ।
 हांसिते खेलिते आइल सक्खे फाल्गुन मास ॥ ८

॥ फाल्गुन ॥

एइत फाल्गुन मासे वसन्ते वहे बासो ।
 सुखाइल आमार अष्ट तालुया निला करिल रासो ॥ ९
 माहुया भाइ मारे माइ बाभिया चारि आइल ।
 सिख यदि कुभाजन हय गुरग्रे खाय गाइल ॥ १०
 केमन तोमार गुरु ज्ञाने दिखे खडि ।
 नागाइल पाइले ताहार मुखे मारि भाठार बाङ्गी ॥ ११
 सुन सुन छोडे कन्या सुन सच्चरि ।
 तोमाने आमाने कथा गुरु केन तुलिम् ॥ १२
 एइ मास भौङ्गानु नीला ना पुरिल आस ।
 हांसिते खेलिते आइल सक्खे चैत्र मास ॥ १३

॥ चैत्र ॥

एइत चैत्र मासे चैताली परव ।
 घरे आबे थार साधु तार वडु गौरव ॥ १४
 एइ मास भौङ्गानु नीला ना पुरिल आस ।
 हांसिते खेलिते आइल सक्खे वैशाख मास ॥ १५

॥ वैशाख ॥

एइत वैशाख मासे मृदस्थ भाङ्गे पुङ्गा ।
 नीलार यौवन देखि र जाली कुमङ्गा ॥ १६
 गुया लया पान लया अखले बाभिव ।
 पुबसेर अन्न आमि यत्नेने राखिव ॥ १७

परेर मानिक साधु देखिले हवे कि ।
 तोमार घरे आबे समुख घन परे खुटे आरवे ॥ १८
 एह मास भौड़ानु नीला ना पुरिल आस ।
 हांसिते खेलिते आदल समुखे जैठ मास ॥ १९

॥ जैठ ॥

एहत जैठ मासे गाबे पाका आम ।
 घरे आबे यार साधु तार वड़ आराम ॥ २०
 एह मास भौड़ानु नीला ना पुरिल आस ।
 हांसिते खेलिते आदल समुखे आसाड़ मास ॥ २१

॥ आषाढ़ ॥

एहत आसाड़ मासे गाबे भड़ा पानी ।
 तोर साधु पड़े मझो उजानि भाटानी ॥ २२
 ये दिन मरिवे मोर प्रानेर निज पति ।
 आउल्लागे माथार कोस हँडिग गज मति ॥ २३
 राम लचन दुह खुट सङ्ग भेजे हवे चुर ।
 दिने दिने मखिन हवे सिंतेर सिन्दुर ॥ २४
 एह मास भौड़ानु नीला ना पुरिल आस ।
 हांसिते खेलिते आदल समुखे बावन मास ॥ २५

॥ आवण ॥

एहत बावन मासे आउसे पाका धान ।
 कोड़ा पखिर डाके आमार सरीर कम्पमान ॥ २६
 एह मास भौड़ानु नीला ना पुरिल आस ।
 हांसिते खेलिते आदल समुखे भाद्र मास ॥ २७

॥ भाद्र ॥

एहत भाद्र मासे गाबे पाका ताल ।
 नारी हजे एवप यौवन राखि कत काल ॥ २८
 यत पारि यौवन तत दिन राखि ।
 राखिते ना पारि यौवन विस आदले मरि ॥ २९
 एह मास भौड़ानु नीला ना पुरिल आस ।
 हांसिते खेलिते आदल समुखे आश्विन मास ॥ ३०

॥ आश्विन ॥

एहत आश्विन मासे दुर्गार अष्टमी ।
 फुले जखे करे पुजा विधवा रसनी ॥ ३१
 कबक १ पुजा मात्रे निव वर ।

मोर साधु बिदेसे गिछे फिरे आसुक घर ॥ २२
 २२ मास भौझानु नीला ना पुरिल आस ।
 हाँसिते खेलिते आदल सम्मुखे कार्तिक मास ॥ २३

॥ कार्तिक ॥

२२ कार्तिक मासे बरिसार खेल सेस ।
 बानिज्य करे नीला साधु फिरे आदल देस ॥ २४

इति ॥

NYLA'S SONG OF THE YEAR.

Agrahāyana = November-December.

Here comes the month of *A'ghan* with its fields of ripening *dhán* ;
 Some men reap, and some men thrash, and others hold *nabán*.
 Yes, let them feast on rice and milk : their winter crops are home,
 But what care I. My heart's own lord in countries far doth roam.
 The month is filled, but not the hope that fills so full my heart.
 Laughing and sporting cometh *Paush*, in turn to play his part.

Pausha = December-January.

"When *Pausha* comes, the wat'ry mists conceal the flowers sweet ;
 "Who dies in *Paush*, no vulture nor jackal him can eat."
 But let them eat, or eat they not, the earth my bones will claim,
 Not e'en for life, would I become another's slave in shame.
 The month is filled, but not the hope that fills so full my heart.
 Laughing and sporting cometh *Mágh*, in turn to play his part.

Mágha = January-February.

And next comes *Mágha* dreary. Oh, the shivering in bed.
 Cotton quilts, and cotton blankets, cosy pillows for the head.
 The month is filled, but not the hope that fills so full my heart.
 Laughing and sporting *Phálgun* comes, in turn to play his part.

Phálguna = February-March.

Lo, *Phálgun* with his winds of spring : and *Nilá* now would cry,
 "My Love, the wind hath made my lips and tongue all chapped and dry.
 "The Fisher-brethren ply the trade from which they take their name ;
 "And when the boys are naughty, the *guru* gets the blame."

"Then, Sir," I'd ask with mocking smile, "what *guru* tutored you*?"

"Oh, if I only had him here, I'd birch him black and blue."

"Nay, hush, Good Wife," the Good Man said, a smile upon his face,

"Whene'er you speak of gurus learned, 'tis you should ask for grace."

The month is filled, but not the hope that fills so full my heart.

Laughing and sporting *Chaitra* comes, in turn to play his part.

Chaitra = *March-April*.

Now comes the month of *Chaitra*, with its *charak pújá* gay.

Happy the woman there, whose lord is with her on the day.

The month is filled, but not the hope that fills so full my heart.

Laughing and sporting *Bais'ákh* comes in turn to play his part.

Vaisákha = *April-May*.

And then comes glowing *Bais'ákh*, when the granaries they break,

And it is my *Nilá's* beauty, that the bloomy melons take.

My husband takes his betel-leaf, and wraps it in his cloth.

"A man's sole wealth it is," he says, "to lose it I'd be loth."

My Good Man dear, for other's wealth do not your wife forsake:

But think of your dear pearl at home, which others fain would take.

The month is filled, but not the hope that fills so full my heart.

Laughing and sporting *Jyaishṭha* comes, in turn to play his part.

Jyaishṭha = *May-June*.

See, here comes merry *Jyaishṭha* with the mangocs on the trees:

If now my Lord were but at home, how I should live at ease.

The month is filled, but not the hope that fills so full my heart.

Laughing and sporting *Asháḍh* comes, in turn to play his part.

Asháḍha = *June-July*.

Asháḍh is come. The *Ganga* 's full.—What words fall from thy mouth?

"Thy husband dead and drowned beneath the tides that fill the south."

If e'er my Life's Dear Lord should die, I'll loose my braids of hair,

And break the necklaco round my neck, all strung with jewels rare.

I'll dash to atoms two fair shells,—a *Rám* and *Lakshman* pair,

And dark will be the *Sindur* line that separates my hair.

The month is filled, but not the hope that fills so full my heart.

Laughing and sporting *S'rāban* comes, in turn to play his part.

* *Khaḍi* is the chalk which is put into the hands of children, when they are learning the alphabet.

S'rāvaṇa = July-August.

Here comes the month of *S'rāvaṇ* ; the *a-us* is in the ear ;
 The *Komḍā* calls, and, at his voice, my body shakes with fear.
 The month is filled, but not the hope that fills so full my heart.
 Laughing and sporting *Bhādra* comes, in turn to play his part.

Bhādra = August-September.

With *Bhādra* all the *Tūl* fruit are ripening day by day
 A woman I, how long shall I, keep my youth fresh as they.
 Long as I may I'll keep my youth,—a woman's all, say I.
 And when my youth is gone from me, I'll poison take and die.
 The month is filled, but not the hope that fills so full my heart.
 Laughing and sporting *Aśvin* comes, in turn to play his part.

Aśvina = September-October.

Here comes the month of *Aśvin*, with dread *Durgā's Ashṭamī*.
 With flowers and water will I make a widow's heart-felt plea.
 Let others worship as they will : I too will ask a boon :
 That my dear husband far away, may homeward travel soon.
 The month is filled, but not the hope that fills so full my heart.
 Laughing and sporting *Kārtik* comes, in turn to play his part.

Kārttika = October-November.

And with the month of *Kārtik*, the yearly round is o'er,
 And *Nilā* dear, his traffic done, is welcomed home once more.

In conclusion I would plead guilty to, I fear, many inaccuracies in the preceding translations. Many of the words used are devoid of meaning even to the singers. They have found them in the song, and it is not their business to alter things written in the *Satya Yuga*. Sometimes they are unable to explain whole passages, saying, "It is a *Satya yuger kathā*, how are we to know it." For other words they have a traditional meaning, which I am fain to accept for want of a better. For instance, I am told that *नोनजिल*, in the Tiger song, means "both", and have translated it so, because I fail to trace the derivation of the word. There are several gentlemen throughout the district who take an intelligent and lively interest in its dialect, but even their help has been sometimes ineffectual in unravelling a Gordian knot.

Notes on the Bhars and other Early Inhabitants of Bundelkhand.—By

VINCENT A. SMITH, B.A., B.C.S.

(With one plate.)

The origin, history and fate of the Bhar* tribe have long afforded material for speculation and enquiry to students of local antiquities and history in the eastern districts of the N. W. P. and Audh, but hitherto no attempt seems to have been made to trace the westward extension of the race, or to collect any information concerning it in the districts west of Alláhábád and Banda. The following notes are the result of observations and enquiries made in the Hamírpur District during the last two years, and, incomplete and fragmentary though they are, they will I hope be found to supplement usefully the information previously collected by observers in the eastern districts and to throw some light on the history of the Bhar tribe.

The Census returns of 1872 give the total number of Bhars in the N. W. P. as 243,462, and of Ráj Bhars as 13,181, the grand total being 256,643: the district details† show that the tribe is now almost exclusively confined to those eastern districts which were formerly included in the Province of Benares and in the kingdom of Audh: the census figures may not perhaps be perfectly accurate, but they certainly indicate correctly in a general way the distribution of the tribe throughout the N. W. P.

It will be observed that not a single Bhar is recorded as residing in any of the Bundelkhand districts; it is, however, well known that the Bhars were once numerous in Banda, and the information which I have collected proves that in former times they lived in every part of the Hamírpur District, and were even found in the Jhánsí District west of the Dhasán River: how much farther west they may have extended I have at present no means of judging, but it is evident that the tribal movement has been from the west eastwards, and it would therefore appear that the answer to the question 'who were the Bhars'? should be sought, not, as has hitherto been done, in the localities where they have been driven to bay, but rather in those western regions from which they emigrated.

The former presence of the Bhars in the Hamírpur District is attested by the traditions, which will be presently described, and by local names in every pargana.* A few examples of such names out of many may be of

* The name is usually spelt 'Bhar', but the spelling 'Bharr' would more accurately represent the pronunciation.

† Details are:—

RAJ BHAR.—Jaunpur (256): A'zamgarh (316): Gházípur (5,631): Gorakhpur (1,464): Basti (5,814). Total 13,481.

BHAR.—Meerut (22): Badáon (14): Ágra (130): Kánhpur (1248): Alláhábád

interest; thus, the old name of the town of Sumerpur (in Parg. Sumerpur) is Bharuá, and in the parganas of Maudhá, Panwári-Jaitpur, Jalálpur, and Ráth, respectively, we find localities named Bharsawán, Bharwára, Bharkharí or Barkharí, and Bhanpaurá Kherá, and in several of these cases the evidence of the name is confirmed by that of tradition.

There seems to me to be little doubt that the Bhars are a non-Aryan race, and are the congeners of the Gonds, Kols, Bhils, and other more or less wild and predatory hill tribes who once occupied Bundelkhand. It is, as Sir H. Elliot* observes, "confessedly very difficult to trace the connexion or difference between the aboriginal tribes of Bhars, Cherús, Seorís, and Kols", and Mr. Sherring† believes "that many of the aboriginal tribes of India were originally blended together." Whatever may be the precise connexion between the so-called aboriginal tribes, it is quite certain that several of them occupied Bundelkhand simultaneously and jointly, and I suspect that in traditions they are often confounded. For instance as in the case of M. Gund‡ (in Parg. Panwári-Jaitpur), where the name points apparently to the Gonds, the original settlers are spoken of as Chamárs: in such cases I suspect that the term Chamár is used in a vague way to cover the ignorance of the speaker, and is practically equivalent to "low caste barbarian"; the word Chamár it will be remembered is not properly the name of a tribe, but simply means a worker in leather. I think it very probable that the Chamárs, who now form the most numerous element in the low caste labouring population, are an extremely heterogenous body, and have but recently been developed into a caste formed of the fragments of tribes, which were free from the trammels of caste, and were alike unclean and impure in the eyes of the Brahmans, and whose remnants have now been lumped together by Brahman pride as the men who work in leather, the unclean thing.§

We have no direct knowledge of the inhabitants of Bundelkhand at the dawn of history; our earliest piece of information is that afforded by Hiouen Tshang in the 7th century A. D., who states that the king of Kha-

(76): Jaunpur (14,695): A'zamgarh (74,144): Mírzápur (4,338): Benares (34,805): Gházípur (53,060): Gorakhpur (43,152): Bastí (17,322): Gárhwal (456).

Total 243,462.

[From N. W. P. Census Rep. I, pp. 105, 135]

* Beames' Elliot, I, p. 60, s. v. Cherú.

† J. R. As. Soc. V., N. S., p. 399.

‡ Here, as in many other villages in the south, a Gond ghost is locally worshipped.

§ In connection with this subject, it may be noted that the *kustá* or waistcloth, worn by the low caste women of Bundelkhand, seems to be the same garment as that used by the women of the Maiwár Bhils (J. A. S. B., XLV, Pt. I, pp. 355 and 289): and the same dress is used by the Gonds (Beames' Elliot, s. v. Gond).

juráho was a Brahman. About 800 A. D., the Chandel dynasty arose and ruled in Kálinjar, Khajuráho, and Mahobá, but the inscriptions which give us the names and lineage of the rulers tell us nothing of the ruled. Chand in his account of the Chauhán and Chandel war (in 1184 A. D.) gives us a glimpse of the subjects of the Chandels in his list of the warriors of the Chandel prince Parmál; the list names Isur Dás Lodhí Bhupál, two Gonds, a Baghel, a Gahlaut, and others, but in what I have read of Chandís poem I have not found any mention of the Bhars. Famous though the Chandel dynasty is for the great embankments and splendid temples constructed under its auspices, I believe that, even in its flourishing days, the country was but very partially cleared, and was chiefly inhabited by sundry hill tribes, who owned indeed a certain allegiance to the Rájá, but yet lived for the most part free of control, and indulged with little restraint in their hereditary propensities for fighting and plunder. According to the census returns of 1872, the Chandels in the Hamírpur District number only 656, and, although they were undoubtedly once much more numerous than now, I do not believe that they ever colonized the country in large force. In the Mahobá pargana the Chandels are zamíndárs, I think, in only two villages; in the rest of the district I do not know of their holding a single village, and the local* traditions of the many villages in every pargana which I have examined, in no case mention the Chandels as the former owners of the soil, but everywhere we find traces of Gonds, Kols, Bhíls, Bhars, Káchhís, Ahírs, Chamárs, and other low caste and outcast people as the original occupiers of the land.

I believe then that the Chandels were simply a small clan who supplied the members of the ruling dynasty and much of the *personnel* of the local court, but who never supplanted the tribes that were in occupation of the soil previous to the rise of the dynasty. But the Bhars and Gonds and their fellows have now disappeared, or have at least lost all tribal individuality, and can no longer be identified under the old names, and other races are lords of the soil. In other parts of India a similar transfer of the land seems to have occurred, but there the history of the change is obscure and the details unknown; here, however, the outlines of the revolution can be clearly traced, and even some of the details can still be vividly presented.

Whatever may be the truth with regard to eastern Audh, where Mr. Carnegy† with apparently considerable reason, doubts the reality of the fact of a Rájput conquest, there is no doubt that in the Hamírpur District the Bhars, Gonds and other early occupiers of the soil, were in compara-

* For some of this local information I am indebted to notes made by natives employed by Mr. W. Martin, C. S., and to his contributions to the N. W. P. Gazetteer.

† J. A. S. B., Vol. XLV, (1876), p. 297 seqq.

tively recent times vanquished by force of arms and obliged to yield their lands to the conquerors, who either exterminated the vanquished or reduced them to a servile condition: in a great portion of the district the victors were Rájputás, but in extensive tracts they were* Lodhís, themselves a tribe of probably non-Aryan descent. It is impossible to say exactly when this contest began and when it ended, but it was protracted and intermittent, and certainly lasted from 1080 A. D. to 1730 A. D., as I now proceed to show in some detail.

The Sárdúl Charitra, a metrical chronicle of the Bágrí Thákurs, relates the manner in which 750 of that clan treacherously destroyed at Kahrá, in the west of the Banda district, 1000 Kols and Bhíls, and then seized their villages in the year 1137 Samvat = 1080 A. D.; the story is curious and interesting, but is too long to quote: it is to be observed that at the date mentioned in the chronicle the power of the Chandel dynasty was at its height. Another similar tribal record tells of the conquest of the Bhíls in the same tract of country by the Mauhárá Thákurs in the year 1239 Samvat = 1182 A. D.

The parganas of Hamírpur and Sumerpur are now almost exclusively held by Buis, Gaur, Gautam, and other Thákur clans, most of whom retain more or less distinct traditions of their having entered the country from the north-west, cleared the jungle and founded the existing villages: for example it is still remembered how in the year 1405 Samvat = 1348 A. D., Bija Rai Gaur came from Ajmír and entered the service of Hamír Deo Karchulí, the founder of the town of Hamírpur, and settled his followers and relatives in twelve villages in the neighbourhood: and many other similar traditions might be related, though a precise date is not generally given.

I have already mentioned that the local nomenclature of the northern parganas shows traces of the presence of the Bhars previous to the Rájput invasions.

It is plain then that in large tracts of country the wild tribes had been early overpowered, but in many places they held their ground much longer: thus the story is told that the Bhars of Islámpur† in the north of the Ráth pargana were punished by Islám Sháh for looting royal treasure, and it seems most probable that the prince referred to was Sher Sháh's son Islám Sháh, who reigned from 1545-53 A. D. and whose favourite capital was Gwáliár.

At Maudhá in the east of the Hamírpur District mention is made of

* I use the form Lodhí in preference to Lodha, because the former is that commonly used in Hamírpur.

† Here and in several neighbouring villages the Bhars are remembered as Bharé Thákurs: the desire of low caste tribes to pass as Rájputás is well known.

the Kols so late as the year 1730 A. D., when a battle took place between Dalí Khán, a son of the Súbahdár of Alláhábád, and the Bundelás, the latter being assisted by the Kols, with whom Dhánuks, Kanjars, and Kanjers are said to have been associated.

The foregoing details show the gradual manner in which the aboriginal* tribes have been supplanted.

The interesting question as to the nature of the religion of the Bhars was raised by Mr. Sherring,† and has since been discussed by Mr. Carnegie. The former gentleman came to the conclusion that the Bhars were Buddhists; and the latter arrived at the somewhat ambiguous result that the “god-neglecting, caste-disregarding race” which formerly held Eastern Audh were the Bhars.‡ Mr. Sherring’s arguments and the plates of Bhar sculptures, published in illustration of his essay, seem to me to prove that the religion of the Eastern Bhars was Jain rather than Buddhist, and the facts which I shall now mention are I think sufficient to raise a presumption that the Bhars and other aborigines of Bundelkhand during a period of at least two or three centuries professed Jainism, though perhaps not exclusively. It may well be that in earlier times they were Buddhists, for the close relation between the Jain and the Buddhist faith and the high antiquity of the former are only now beginning to be perceived.

A tradition is current at Mahobá that many years subsequent to the conquest of that city in the reign of Shiháb-uddín§ (1202-3 A. D.), Ajaipál and Bhar and others, seven brothers who were Jains and Jogis and great magicians, became rulers of the country: Ajaipál conquered Ajmír, but Bhar held Mahobá, and so oppressed the Musalmáns that they invoked the aid of Malik Sháh who came from the west, and after a bloody contest slew Rájá Bhar and his fourteen sons, whose wives then burned themselves without the aid of fire, the place where they sacrificed themselves being pointed out to this day as the *Chaudah Rání kí satí*, i. e., the burning-place of the fourteen queens.

Mauza’ Bharwára in pargana Panwári-Jaitpur is said, according to the local tradition, to have been founded by Rájá Bhar of Mahobá|| and to have been occupied by Lodhís in 1300 Samvat (= 1243 A. D.): as illus-

* I use the word ‘aboriginal’ as a convenient term, but as I have hinted above some of the so-called aborigines may themselves have moved from their original seat.

† In the essay already quoted, p. 228.

‡ J. A. S. B., XLV, Pt. I, 299.

§ Mr. Blochmann, in J. A. S. B., XLIV, Pt. I, p. 277, proves the correct date of the conquest.

|| A tradition is quoted in N. W. P. Gaz. I, pp. 406-7, to the effect that a temple at Dadhwá Manpur Garrampur in pargana Badausá of the Banda District was the treasury of the Bhar Rájás of Kálinjar, whose descendants continued to use it until a recent date: this is the only reference I know to Bhar Rájás of Kálinjar.

trating the supposed connection between the Bhars and Jainism, it is noticeable that at Dinai about a mile from Bharwára there is a colossal Jain image of Setnáth with an inscription dated 1196 Samvat (= 1139 A. D.), and the ruins of a highly ornamented temple are a conspicuous object on an adjoining hill top. In other localities I have found at and near Bhar sites small Jain sculptures which it would be tedious to specify. The earliest known Jain inscription in Bundelkhand, (supposing its date to be correctly read, which is doubtful*) is one at Khajuráho, dated 1011 Samvat = 954 A. D., in the reign of King Dhanga: the other Jain inscriptions from Khajuráho and Mahobá, enumerated by General Cunningham (Arch. Rep. II, 448), range from 1142 to 1234 Samvat, i. e., 1085 to 1177 A. D.: eight additional dated Jain inscriptions, which I know of in various places in the Hamirpur District, range from 1196 to 1232 Samvat = 1139 to 1175 A. D. At Khajuráho all the important temples, whether Vaishnava, Saiva, or Jain, seem to have been erected in the eleventh century A. D.†: we may therefore safely affirm that Jainism flourished in Bundelkhand during the eleventh and twelfth centuries A. D. side by side with other forms of religion, and we have already seen that during the same period much of the country was occupied by the Bhars and other aboriginal tribes.

I have already mentioned that Mr. Sherring's arguments to my mind proved the eastern Bhars too to be Jains; chance enables me to offer a fact in confirmation of this theory.

I lately obtained from Banda a collection of hymns to the twenty-four deities of the Digambar Jains as there recited at a Jain shrine: the first hymn is addressed to Ádináth, and its opening lines which I quote‡ below, show that the ruined Bhar stronghold Pampápur near Mirzápur, the locality described in detail by Mr. Sherring, is still a sacred place of the Jains.

A Bhát supplied my paṇḍit with lists, as complete as he could remember, of the Bhar and Gonḍ tribal deities; the following he named as the Bhar gods:—

* Cunningham, Arch. Rep. II, p. 433, and J. A. S. B., XXIX, 396.

† Fergusson, Ind. Archit., p. 245.

‡ आदिनाथ परमेश्वरसामी ऋषभदेव मनभायेजी ।

वाहन साङ्ग जनेवर राजौ पंपापुर को आयेजी ॥

गलियन १ खिरन जानौ दूँडत आदि मुनीसुरजी ।

पंपापुर संभ भवन में ठाकुर आये बिराजेजी ॥

§ The Gonḍ deities he remembered were: (1) Narhar, (this is mentioned by Chand as the name of a Gonḍ champion): (2) Nagesur: (3) Jhakajhok: (4) Gunraiya: (5) Karuwá.

(1) Satti-Sattá : (2) Mundá Deo : (3) Bhainsesur : (4) Ratásá or Raktásá : (5) Bharráha Jári : (6) Jhapatá : (7) Marahi : (8) Bharáyagr.

The worship of these minor deities may of course have been practised by persons professing Jainism, in the same way as worship is now offered to scores of obscure local gods and demons, by persons professing various forms of Hinduism. It is possible that the Bhainsá Darwáza, one of the gates of the town of Mahobá, may be named after Bhainsesur.

Antiquarian visitors to Mahobá are familiar with the temple of Maniyá Deo, the tutelary deity of the Chandel Rájás ; it is curious that the only other shrine in the Hamírpur District, so far as I know, dedicated to this divinity is found at a village named Barel in pargana Ráth, where there are indications near the modern village, which is occupied by a Lodhí population, of the former existence of a town or large village which has long since disappeared. This locality seems to be the Bharel* named by the above quoted Bhát as one of the Bhar villages, and some sculptures exist in the village such as are found at Bhar sites. It becomes, therefore, possible that Maniyá Deo was a Bhar goddess, and, if this be the fact, the circumstance throws some light on the origin of the Chandel race, which is admittedly impure. I had not an opportunity of seeing the object of worship at Barel, but the cherished image at Mahobá, which I have seen, is simply a shapeless block of stone daubed with red, and evidently represents none of the Hindú gods, whereas it is exactly such an object as we might expect to be the fetish of a tribe of hill men. There is not, so far as I am aware, any tradition of a close connection between the Chandels and the Bhars,† but with the Gonds the Chandels are known to have maintained constant intercourse, sometimes friendly, and sometimes hostile. Chand tells us that the Chandel Rájá Kírat Singh hunted at Maniyá Garh with Singh the Gond chieftain of Garha Mandlá on the Narbadá, and that afterwards when war broke out, Kírat Singh was taken prisoner by the Gonds, an injury which was revenged by Alhá in the reign of Parmál. The name of the Gond hunting ground Maniyá Garh inevitably suggests that Maniyá Deo may be a Gond as well as a Bhar deity, and, if this supposition be correct, an additional proof is obtained that there was little difference between Bhar and Gond. In the hills of the Kaimúr Range in Ríwá, east of Bundelkhand, the Bhars, Suriyás, Cherús, Bindus, and Kharwárs may still be

* The loss of the initial aspirate in local names is very common ; thus in the Hamírpur District, Bilrahh and Bilahanrí were formerly Bhíl villages, and in Audh (J. A. S. B., XLV, Pt. I, p. 300) Badoí, Barrosá, Baráich, and Bareli derive their names from the Bhars : and many similar examples might be given.

† Oldham, 'Stat. Memoir of Ghazipur' (I, 48), states that Chandel Rájputs murdered the Bhar Rájá and founded the principalities of Bijaigarh, Bardhi, and Barhar in the Ríwá territories.

found intermingled, and "intermarriage between the daughters of the Kharwár chief and a Chandel Rájput prince is mentioned in the annals of Bundelkhand."* In Lalatpur, too, the connection between the Gond and Chandels seems to be remembered,† and the story of the marriage of Durgávatí of the Chandel line with the Rájá of Garha Mandlā‡ shows that the connection subsisted so late as the sixteenth century A. D.; there is therefore nothing improbable in supposing that the myth of the union of Hemávatí with the moon as related in the Chandel legends was invented to conceal the fact that the Chandels really sprang from an aboriginal stock; whether this stock was called Bhar or Gond we cannot say, and, if I am right in thinking the two tribes to be very closely connected, the question is of no importance. The construction of the great Vijayanagar or Bijánagar lake near Mahobá is attributed to the Gaharwárs, who are said to have preceded the Chandels in that part of the country, and I think it is not unlikely that the Chandel clan is the result of crossing Gaharwár with Bhar or Gond blood: the popular legends indeed assert the fact of relationship between the Gaharwárs§ of Benares and the Chandels.

The Bhars of Bundelkhand, so far as we know them, seem to have possessed little of the arts of civilization, and to have consequently left behind them almost nothing of architectural or artistic interest. In the eastern districts the Bhars are credited with the construction of many tanks and massive forts, but in Hamírpur I have not met with a single fort or tank the construction of which is ascribed to them; everything old is indiscriminately called Chandel, and is usually placed to the credit of Rájá Parmál or his famous champions Alhá and Udal: it is, however, probable that some of the works attributed to the Chandels were executed by other races. The commonest objects of antiquity in the district are rude bas-reliefs of Hanumán, here usually called Mahábír, and there is scarcely one of the numerous sites of ancient abandoned villages, whether Bhar or otherwise, which is not marked by an image of the monkey-god.

Upright slabs or pillars of granite bearing on one face a pair of rudely carved figures in relief, are met with in many places. The design consists of two standing figures, one male, and the other female, holding each other by the hand: at the top left hand corner of the stone there is a detached

* Chandra Sekhara Banurjí, in J. A. S. B., Vol. XLVI, Pt. I, p. 25. I do not know what annals are referred to.

† N. W. P. Gazetteer, Vol. I, p. 351; but the statement there may be based only on Sleeman's narrative.

‡ Sleeman's *History of the Garha Mandlā Rájás* in J. A. S. B. for 1837, Vol. VI, (2), pp. 621-648.

§ *Vide* Cunningham, Arch. Rep. II, 'Mahobá' and Beames' Elliot, s. v. Bhar, Chandel, Gaharwár.

open hand, and in the corresponding right hand corner a crescent moon and a circle representing the sun.

These sculptures appear to be *satī* monuments: they are very common in Pargana Jaitpur and are there sometimes spoken of as 'Sati-Satā'. Jaitpur was occupied by Gondas, who were expelled by the Bundelās and Marāṭhas. At an ancient village in pargana Rāth I found two of these stones, and close by, a *satī* pillar of the ordinary type* bearing only the emblems of a female hand and arm with the sun and moon, but without human figures. Stones sculptured with the sun and moon emblems, unaccompanied by either figures or hand, are often met with.

Rude effigies of single warriors, armed with a bow, or with a round target and a short straight-pointed sword, are also common.

I append a rough sketch or diagram (Pl. XIV) of a curious slab standing in the village of Tika Mau near Mahobā: the village is an ancient one, and is mentioned by Chand as belonging to Desráj, father of Alhá and Udal, and according to tradition was formerly occupied by Kurmís: the design resembles in general outline that of the "*satī-satā*" sculptures above described, but differs in that the male and female figures are not holding hands and have heads resembling respectively a monkey and a bird, and that the detached hand is placed between the sun and moon.

On the surface of the mound marking the site of a Bhar village at Barenrá in Jalálpur, my paṇḍit picked up the two curious objects figured at the bottom of Plate XIV. They look like seals or amulets, and the material seems to be the coarse soap stone found in the district: I cannot even guess the meaning of the characters engraved on them, but the open hand on the larger one is exactly similar to that carved on the stone monuments. As is the case at many ancient sites in the district, bricks of great size are found at Bareṇrá.

The Bhar site named Bhaṛeswar near Rauro in pargana Rāth is remarkable for an irregular circle formed of twelve large upright stones, close to which two other stones are lying prostrate: one of the slabs here is carved with five small detached rings, called *nakat-goḷ* by the people, which remind me of the "cup markings" in Kamáon, described by Mr. Carnac: coins are said to have been found at this spot, but as usual I could get no definite information about them.

I have often seen at old sites slabs engraved with sets of concentric rings a foot or more in diameter, which most probably symbolize Mahádeo, as conjectured by Mr. Carnac with reference to the similar sculptures in Kamáon, or may perhaps be images of the sun as the villagers say.

Cunningham, Arch. Report III, p. x.

† J. A. S. B., XLVI, Pt. I, p. 1 seqq.

Further local enquiries, or a happy accident, may put me in possession of additional information about the Bhars of Bundelkhand, but at present the foregoing notes embody all that I can ascertain on the subject.

EXPLANATORY NOTE.

The preceding essay was written to illustrate a bronze plate inscription which purported to record a victory of the Lodhís over the Bhars of Parganas Ráth and Jalápur in the year 1404 Samvat, and was read before the Society* in its original form.

Sir E. C. Bayley and Dr. Rájendralála Mitra are of opinion that the inscription described by me is not genuine, and their opinion is based on arguments which I readily admit to be conclusive: the forgery was a clever one, but not sufficiently clever to deceive competent scholars.

I have therefore cut out from my paper all references to the inscription, and much other matter which rested on the authority of the paṇḍit, who beyond doubt contrived the forgery.

All information derived from a tainted source is of course open to suspicion, and therefore I must specify the assertions still remaining in the text of my paper which rest on information supplied by the incriminated paṇḍit.

The tribal records of the Bágrí and Mauháṛ Thákurs were furnished by him in copies: the originals he said he had met with while employed on a tour of investigation under the orders of the Settlement Officer at Banda: there seems to be no particular reason why these documents should have been fabricated.

The Jain hymns, one of which I quote, were also brought to me by the paṇḍit, who professed to have taken them down from the dictation of a person who takes care of a Jain shrine at Banda; they are of little interest and not likely to be inventions.

The lists of Bhar and Goṇḍ deities, the name of Bharel as a Bhar village, and the names of Bilrákh and Bilahanṛí as Bhíl villages, rest on the authority of a Bhát as reported by the paṇḍit, and I have no special reason to suppose these particulars to be untrue.

The seals or amulets, whichever they are, were brought in by him, and seem genuine; but I have not visited Bareṇṛá myself.

After the excisions it has undergone, my essay, I fear, presents a very disjointed appearance, and retains little of value or of interest.

V. A. SMITH.

12th December, 1877.

* *Vide* Proceedings, As. Socy. Bengal, for December, 1877.

*An unpublished Ghazal by Háfiz.—By H. BLOCHMANN, M. A.,
Calcutta Madrasah.*

In the Proceedings for November 1874, (p. 208), I noticed a MS. collection of choice verses containing an autograph of Prince K̄hurram (Sháhjahán). Among the poems, the following *ghazal* by Háfiz is given, which I have not seen in any MS. or printed edition of his *Díwán*. The style is easily recognized as that of Háfiz. (Metre, long *hazaj*.)

بحمد الله که بازم دیدن رویت میسر شد *
 ز خورشید جمالت دیدۀ بختم مژور شد
 بصورتخانهٔ دل روز تنهایی وصال را *
 بدان صورت که با خود نقش می بستم مصور شد
 مرا از لطف تا بر سر نکندی سایۀ رحمت *
 همای بخت و دولت بر سر من سایه گستر شد
 نوید مقدمت دادند دادم جان بشکرانه *
 که آنم موجب عیش دل اندر پرور شد
 ز روی مردمی جانا قدم بر چشم حافظ نه *
 که جایب در درون دیدۀ روشن مقرر شد

1. Thanks be to God that a sight of thy face has again been granted me: the sun of thy beauty lights up the eye of my destiny.
2. In the gallery of my heart I painted the day of my loneliness in those (bright) colours in which I paint to myself the day of meeting thee.
3. When in thy love thou castest upon my head the shadow of mercy, the phoenix of fortune and success casts his shadow upon me.
4. The news of thy arrival was brought to me, and I gave up my heart to thanksgiving; for this was an occasion of joy for my grief-fostering heart.
5. Put boldly, O love, thy foot upon the eye of Háfiz; for within his beaming eye a place has been made for thee.

A Grammar of the Language of Eastern Turkistán.—By R. B. SHAW,
Political Agent.

INTRODUCTORY.

The Turkish tongues are of singular interest to the student of language. They are to him, what the mountains which surround their birth-place are to the geologist; who there can observe many of the vastest operations of nature and their results, naked as it were, and not veiled by the superficial covering which in other less barren countries makes the investigation and tracing out of the various formation so laborious a task.

The Indo-European languages are like an ancient building, where frequent restorations have interfered with the original design, and where finally a universal coat of plaster has destroyed all outward distinction between old and new. In the Turanian structure, on the other hand every tool-mark is still fresh, the places where the scaffolding has rested, are still visible, and we can almost trace each course of the stone-work to its origin in the quarry whence it was hewn.

It may seem strange that a language developed by the rude and nomad tribes of Central Asia, who in their own home have never known how to reduce it to rule (or rather to distinguish the laws through which they themselves had unconsciously formed it), should present in fact an example of symmetry in complexity such as few of the more cultivated forms of speech exhibit. Although its own people would have one believe that it is subject to no rule and almost purely arbitrary (their only notion of grammar being that of Arabic and Persian with which the Turkí cannot be made to fit); yet in reality a few simple and transparent rules suffice to account for all its permutations. These rules, possessing an accumulative power, are enough to produce the immense variety of forms noticeable in the Eastern Turkí.

We are now learning to believe that even in languages such as Greek, German, or even English, every seeming irregularity is really the result of laws, some of which we know and can trace in their action, and some of which are yet to be discovered. But in Turkí we can *see* them; it is as if the centuries were to flow backwards, and we could watch the building of the Pyramids and solve by ocular demonstration the doubts of the learned as to the method by which the vast blocks were transported from the quarries, and placed in their present positions. We can even detect in some instances a commencement in this Turanian tongue, of the process by which the Aryan languages have been polished down and enamelled, as it were, till they reached their present condition.

Viewed in this light the study of the Eastern Túrki is seen to have an interest which is not to be measured by the amount of the commercial or other intercourse likely to be facilitated by it. For the Turkish tongues, a journey eastward is pretty nearly equivalent to a study of the earlier forms of an Indo-European language. In either case we get nearer to the source ; and the less literary character of the former makes it easier to approach its origin in space than in time. Rémusat, in his "*Langues Tartares*"*, truly says : "Le dialecte de Constantinople est celui de tous qui s'est le plus enrichi, je pourrais dire appauvri, par l'introduction de mots Arabes et Persans ; et l'on n'en rencontre que fort peu dans la langue des Túrks voisins de la Chine, où l'on peut, pour cette raison, espérer de retrouver l'antique langue Túrke dans un état plus voisin de sa pureté primitive."

Valikhanoff (the son of a Kirghiz chief in the Russian service, whose name, Valí Khán, with the affixed Russian patronymic ending *off*, is significant of Russia's progress among those tribes) writes :† "The language.....spoken in Káshghar is altogether unknown to European savants", and Prof. Vámbéry, in quoting him, adds that this language "has incontestably the most primitive words and formations amongst all Turkish forms of speech."‡

In the Turkish of Káshghar and Yarkand (which some European linguists have called *Uighur*,§ a name unknown to the inhabitants of those towns, who know their tongue simply as *Túrki*), we can obtain a glimpse backwards at a state of the language when the noun (which in Western Turkish is almost inflected) was but a rude block, labelled if necessary by attaching other nouns, &c., to show its relation to the remaining words of a sentence, as in Chinese. Of these attached words we can still see the meaning and special force, and can even use some of them as independent parts of speech (see below in Chapter III and Chapter VII, Numerals). It requires scientific dissection to extract and realize the meaning of the genitive element in the Latin word "*rosæ*," for instance ; but the Túrki genitive *ulus-nung* ("tribe's," lit. "tribe property") bears its origin on its face, and it cannot be very long ago that the word "*nung*" or "*neng*" would have been used freely to mean "goods" or "possessions", as it is in the Kudatku-Bilik|| (translated by Prof. Vám-

* Page 250, edition 1820.

† See Messrs. Michel's "*Russians in Central Asia*".

‡ Vámbéry's "*Chagataische Sprach-studien*", p. 3.

§ This would seem in many cases to be a misnomer as applied to the modern language of Káshghar.

|| E. g. *ula neng* "bestow (thy) property."

béry). The mark of the accusative *ni* is at the present day in common use as an independent pronoun signifying "what".

When we follow these affixes into Western Turkish, they seem to have lost their initial consonants, and to have sunk into mere inflectional terminations.*

At the early period above referred to, the verb was perhaps a mere noun of action, destitute of any conjugation, although afterwards labelled by means of certain syllables (originally independent words) to indicate the several times and modes of the action. Such compound words, which could hardly be considered verbs, would apply equally to the *agent*, the *action*, and the *object* acted upon. In this stage the Túrki verb would have answered to the description of the same part of speech in an allied tongue: "The Tibetan verbs must be regarded as denoting, not an action or suffering or condition of any subject, but merely a *coming to pass*... they are destitute of what is called in our languages the active or passive voice, as well as of the discrimination of persons, and show nothing beyond a rather poor capability of expressing the most indispensable distinctions of tense and mood.....The inflection of verbs...is done in three different ways:.....(c), by adding [to the Root] various monosyllabic appendices, the Infinitive, Participles, and so called Gerunds are formed." [Dr. Jaeschke's Tibetan Grammar, printed at the Moravian Mission Press at Kyelang, in British Láhaul, Chapter VI, §§ 29 and 30], (see also page 262, below).

A further development of the language would consist in also labelling these verbal nouns with the several pronouns or the corresponding possessive affixes (according as the desired sense might require) to point out the subject of the action; and thus were at last obtained several tenses of a real conjugation.

This will be seen by an inspection of the following comparative statement:—

	Root.	Káshghari Post-positions.	Osmanli terminations.
Nom.	<i>át</i>		
Gen.	<i>át</i>	<i>ning</i>	<i>-ung (uñ)</i>
Dat.	<i>át</i>	<i>gah</i>	<i>-ah</i>
Acc.	<i>át</i>	<i>ni</i>	
Abl.	<i>át</i>	<i>din</i> &c.	<i>-ín</i> &c.

All these stages of the Túrki verb formation co-exist in the present language of Yárkand. If one asks a man whether he has seen so-and-so, he replies : “*körgan*.” This word may denote equally “the person who sees”, “the thing seen”, and “the action of seeing.” But in a case of ambiguity, or for greater emphasis, he might also answer : *körgan-im bár* (lit. “*my seeing exists*”), or *körgan-man* (lit. “*I the seer*”). In one case the possessive (*im* “*my*”), and in the other the personal pronoun (*man* “*I*”), is affixed ; and thus the 1st Person singular of two (Indefinite) Past Tenses is formed. These are the two typical modes of forming the persons of a tense, and there is no other.

Out of such simple materials is the whole Turkish conjugation produced, which Prof. Max Müller compares to a tree with innumerable branches, each of which is bowed down to the earth by the weight of the fruit which it bears. The above form, *kör-gan*, is but one of the several verbal nouns produced from the root *kör* ; the same root when labelled with other affixes, instead of *gan*, denoting different times (tenses) or modes (moods) for the action, forms various verbal nouns and participles. These participles, either attached to pronouns as above, or in composition with auxiliary participles which are so attached, produce the whole of the 270 (and odd) tense-persons of which a primary Túrki verb conjugation consists.

Rémusat charges the Eastern Túrki (Ouigour) with employing no true auxiliary verb, *i. e.*, according to his definition, an auxiliary personal future or past tense applied to a participle, either *future* or *past* (not *present*). “Il résulte de cette combinaison, des plusque-parfaits, des futurs, des parfaits composés, toutes choses inconnues en Ouigour.”

A further acquaintance has revealed to us, at least in modern Ouigour (“actuellement la langue des habitants des villes depuis Khasigar jusqu’à Kamoul”), all these things which M. de Rémusat had missed. Such tenses as *qelip-idim*, “I had done”, *qelip-bolurman*, “I shall have done”, *qeladurghan-boldum*, “I have determined to do” (lit. “I have become about to do”), answer completely to the above definition. Thus the Túrki tongue leaves nothing to be desired in the way of tense varieties.

But this is not all ; for the root itself previous to the addition of any tense or mood terminations may have its meaning or application modified by other affixes (producing secondary Verbs, Passive, Causative, Reciprocativ, &c.). By the accumulative faculty of the Túrki tongue these produce numbers of fresh forms. Like a gambler who “doubles all round”, each of them adds to the former stock of words a number equal to that which existed without it. Going round to each tense of the original verb and of its compounds, it lays down another by its side. One peculiarity of the process called “playing double or quits” is, as

pointed out by Thackeray in the case of Mr. Deuceace, that after a given number of repetitions (which may be easily calculated) the original stake will have swollen to the size of the National Debt. Fortunately there is a limit to the number of times that a Túrki verb can double its tenses; but still it reaches a figure which sounds most formidable to those who do not know that they can acquire it by a process of multiplication, and are not bound to add each unit separately to the mass of their knowledge.*

With all these possible combinations before him, the Túrki of the East appears to construct his words on each occasion from the elements at his disposal (as a compositor sets up type), rather than to employ ready-made or stereotyped forms. He accumulates affix upon affix until he has completed his meaning, instead of looking about him for a single word to which that meaning is already assigned.† Hence his belief that his language is arbitrary and dependent only on his own will (notwithstanding the fact that he really, though unconsciously, works on distinct and simple principles), and hence also the fact that to him each element of his words retains its separate vitality and meaning. When a Frenchman says “vous êtes,” he has ordinarily no notion that in the termination “—tes” he is repeating the pronoun “vous” in another form. But an Eastern Túrki is perfectly aware of the meaning of the termination in the words *dursiz*, “ye are,” *kelghaningiz*, “ye have done” (‘ your doing exists’), and will not hesitate to use the same pronouns in other applications (as *siz-gabirdim* “I gave to you,” or even superfluously prefixed to the verb, as *siz dursiz*, “ye are”; and so also *át-ingiz*, “your horse”).

As has been justly pointed out by Prof. Max Müller, among nomad families and tribes the tendency to adopt peculiarities and corruptions of language is constantly being neutralized by meetings and by the necessities of intercourse with other families or tribes among whom no such peculiarities, or different ones, have sprung up; while these meetings do

* It may easily be calculated how many separate elements require to be retained in the memory, in order to remember the vast number of forms of a single Eastern Turkish verb. Thus there are about 13 participial (and root) stems, and 25 different syllables or words used in the formation of tenses (including pronouns, auxiliary roots, and participles). There are also 6 modifying syllables, making the secondary verb-forms. Thus absolutely only 44 verb-elements require to be learned by rote, the combinations and permutations of which suffice to make up the entire Túrki verb conjugation amounting to nearly 29,000 possible forms applicable to each separate (transitive) verb root. See N. B. at end of “Verbs.”

† In Eastern Túrki “un-get-at-able-ness” would be a perfectly legitimate form (indeed quite a characteristic one). Vide *Yét-al-mas-lik*, &c.
attain able not ness.

not usually last long enough to allow of the growth of peculiarities common to the whole nation. When people, however, settle down in communities and towns, a certain number of expressions become worn down, as it were, by daily use, and in such a state of society these corruptions would be likely to become fixed and permanent. In this process the rationale of the various formations becomes less evident; the elements of the words are so fused together as to become indistinguishable; from want of recognizable examples men cease to put together unconsciously each word as they want it, and begin to use only those to whose sound they have become accustomed, and which are as it were ready-made. Thus the language loses in its richness of perhaps superabundant forms. It leaves the fluid and enters the solid state.

Even in Central Asia such a process has begun in the towns and villages. Who would recognize in the short word *wopti* the compound tense *bol-up-ir-d-i*, "it had become." Yet a native of Khokand, who will use the former in conversation, will spell it out at the full length of the latter if he has occasion to write it. He has not yet lost his sense of the full force of every one of the five elements that build it up. To a stranger who knew that the infinitive was *bolmaq* (or even *wolmaq*), the pluperfect *wopti* would seem a most irregular form, and would be no guide in forming the pluperfects of other verbs.

The Yárkandi (who lives further East) has not proceeded so far in his corruption of the word. He contents himself with shortening it into *bolupti* (showing greater respect for the root). So *aparado* (or, as the Andijânis say: *aparade*) is used, where the true form is *al-ip-bár-a tur-ur*, lit. "having taken (he) going is standing" (*viz.*, "he is taking away"). The intermediate steps are *alip-bára-trur*, then *alip-bàra-dur*, then *ap-bàra-dur*, and then *apara-dur*; the corruption going on independently in the several members of the word, converting *alip* into *ap*, fusing the initial *b* of *bár* with the preceding *p*, and turning *turur* finally into *do* or *qe*. So also the imperative of another compound verb is shortened from *al-ip-kel* to *apke* or even *akke*. And thus some words travel West, from the desert their birthplace, leaving a letter behind them in each country where they halt, but bearing the scars indelible on their bodies.

In extending itself towards Europe the Turkish tongue seems to approach the inflectional stage of development. Even in such forms as *wopte*, *apke*, and *do* (for *turur*), the root itself, the very sanctuary of an agglutinative language, has been invaded. But, moreover, in Western Turkish the affixes or terminations have become so far blended with the verb that their origin has been lost sight of. Some Grammarians in their analysis have mistaken, for instance, the pronominal affixes for parts of

an auxiliary verb. Thus *kilrum* is by them supposed to be formed from the participle *kilur* and the word *im* "I am" (which is in reality no verb, but a pronoun). M. de Rémusat, in his most learned and interesting researches on the Tartar Languages, sees an anomaly in the fact that, while both in Osmanli and in Ouigour (defined as "encore actuellement la langue des habitants des villes depuis Khasigar jusqu'à Kamoul") there exist the tenses, *kilur-um* and *kil-dum* formed respectively with two tenses of the substantive verb, viz., *im* (*um*), "I am", and *idum* (*-dum*), "I was"; yet this verb only exists in Osmanli, and not in Ouigour. In other words, that tenses in a primitive Turkish language, (Ouigour) are formed by means of another verb which only exists in a later dialect (the Osmanli).

"Pourquoi n'y retrouve-t-on pas plutôt le radical Ouigour *erdi*, ou *dour*, ou *dourour*? Quelle cause peut avoir introduit un élément étranger dans la conjugaison des verbes, la partie la plus intime de la grammaire? Ce fait peu connu, si j'avais réussi à en bien exposer toutes les circonstances, offrirait, ce me semble, un problème philologique assez curieux à résoudre."

The answer is interesting and illustrates the progress of language. The seeming problem results from the degree to which forms, clear enough in Eastern Türki, have become corrupted and obscured in Western Turkish. Taking the Past Tense, *idum*, &c., first, this certainly exists in Ouigour, where it is written *erdim* (ايرديم). The modern Kàshghari supplies the missing link by writing this word as above *erdim* or *irdim* and pronouncing it *idim*. Thus the Ouigour "radical" or auxiliary *erdi* which M. de Rémusat desired, is really present in the tense '*kildum*', '*kildi*', under its later form '*idum*', '*idi*', whose absence from Ouigour he laments.

Next taking the Present Tense *kilar-um*, formed with a supposed Pres. Tense of the Verb Substantive, viz. *im* "I am", &c.—the following comparison with the corresponding Kàshghar (so called Ouigour) or more primitive tense will solve the problem, or rather will show that there is none :—

OSMANLI.				PRIMITIVE.			
		Participle. Supposed Verb Substantive.		KASHGHAR (OUIGOUR.)			
				Participle.		Affixed Pronouns	
S.	1st.	kelur	<i>um</i>	kelur	...	<i>man</i>	(=I)
"	2nd.	kelur	<i>sen</i>	kelur	...	<i>san</i>	(=thou)
"	3rd.	kelur	—	kelur	...	—	—
Pl.	1st.	kelur	<i>iz</i>	kelur	...	<i>miz</i>	(=we)
"	2nd.	kelur	<i>siz</i>	kelur	...	<i>siz</i>	(=ye)
"	3rd.	kelur	<i>lar</i>	kelur	...	<i>lar</i>	(=they)

It is plain that the Osmanli terminations are merely survivals of the primitive affixed pronouns.*

In no case can it be allowed that such a series of dissimilar syllables is really one tense, or that they are parts of the verb "to be."† An examination of the Yárkand and Káshghar dialects accounts for them in another way; and even were this not the case, analogy is against such irregularities of form in a Turkish verb, no sign even of a common root being apparent in the different persons.

Thus, if the Ouigour (Káshghar) form of Turkish does not possess such a Verb Substantive as *im* "I am" (as M. de Rémusat justly says), so neither does the Osmanli. There is no element in these Osmanli tenses which does not exist independently in the so-called Ouigour or Eastern Túrkiistání. Though I have taken Rémusat's words as my text (because they themselves suggest the comparison with a more primitive dialect), yet it would seem that many Grammarians are under the same misapprehension with regard to the supposed Osmanli substantive verb. The pronominal affixes have become so blended in the verbs, as almost to lose all trace of their origin, and what is this but a long step towards inflection.

Thus in the varied dialects of that wide-spread tongue which is spoken over 70 Degrees of Longitude, extending from under the shadow of the Great Wall of China and the head waters of the Yellow River almost to the shores of the Adriatic, we see a whole volume in the history of language unrolled before us. Nearly every stage in the development of speech, between the monosyllabism of China at one end and the highly developed inflectionalism of Europe at the other, can be studied in the dialects spoken by that Turkish race which forms a link between the extreme East and the extreme West of the Old World.

It is hoped that an account, however imperfect, of the more Easterly or primitive form of this tongue will not be without interest to students.

In the following pages it will be noted that the Perfect Participle has been written with a *p*, whereas in the Extracts it will be found to end in a *پ* (*b*). But it must be remembered that the Túrki writers

* If it be urged that besides the use of the syllables *im*, *sen*, &c., as verb-terminations, they are also used with substantives and adjectives, &c., in the sense of the verb "to be"; this may be paralleled by the Eastern Túrki usage by which pronouns are affixed (without any verb) to substantives and adjectives and other pronouns, and yet do not cease to be pronouns: e. g. *kichik-man* "I (am) small"; *Türk-san*, "thou (art) a Türk"; *shu-man*, "I (am) he". The verb "to be" is simply 'sous-entendu' in those cases.

† The present tense of *irmek* "to be" would be *ira-man* or *irur-man*, *irur-san*, &c. This tense is found in old books.

are very chary of wasting more “*nuqtas*” than they can help, and make but seldom a difference in writing (and sometimes in speaking) between پ and ب and between ت and ج. The sound given to the final letter of the Perfect Participle is distinctly that of *p*, as may moreover be discovered from the fact that it hardens the dentals which follow it (in affixes), e. g., *bolu(p)-ti*, and not *bolu(b)-di*, as would be the case according to the Rules of Phonetic Variation (which see) if the final consonant were soft.

Again, it will be seen that I have written *ait-ti*, *ket-ti*, whereas in Túrki manuscripts these words are often written *ait-di*, *ket-di*. This latter spelling is due to a recollection of the origin of the formation (*viz.*, the presence of the auxiliary *irdi* or *idi* in a shortened form), but the pronunciation is in fact that of a double *t*; as in English the word written as “cupboard” is pronounced “cubboard.” The Túrki writers, however, very frequently recognise this pronunciation by merely putting a “tashdid” over the *t* instead of preserving the *d* in the second place (ت for د).



CHAPTER I. •

THE LETTERS.

The letters employed in writing by the inhabitants of Eastern Turkistán are the same as those in general use among Muhammadan nations, *viz.*, those of the Arabic alphabet. It is needless to describe their system of writing at any length since it is known to all Oriental scholars; only the peculiarities of pronunciation, form, or use, will be noted here.

1 A, *d* in the beginning of words is often pronounced very broad (like *aw*); as in *ât* = horse (pronounced *awt* or *ot*).

In other parts of a word, if preceding several consonants together, it is also often pronounced broad.

Ex. : *bâshqa* = other (pronounced *boshqa*).

In other cases, however, it resembles the *a* in *father*.

The short pronunciation of *a* is that of our words *ordinary*, *oriental*, *America*, &c.

In some words the *a* is pronounced like the English *a* in 'hand', 'than', &c.

Ex.: *Yarkand*, pronounced something between that spelling and 'Yerkend'; *at*, 'name', pronounced like the English word 'at' (almost *ett*).

N. B.—As the people of Eastern Turkistán are rather uncertain in their use of the long vowels in writing, the use of them in short syllables being common and not implying any lengthening of the sound, in the following pages the broad mark (*á, é, í* and *ú*) will only be introduced when the *sound* is long, and not invariably wherever long vowels are used.

Ex.: *باشلاماق* will be written *báshlamáq* (pronounced almost *bosh-lamock*). Although there are three 'alifs', yet only the first and third are pronounced long or broad. So also with the other vowels.

پ پ B & P, often interchanged in writing, and often confounded in pronunciation.

ت T, the ordinary oriental, or soft European sound.

ج چ J & Ch, often interchanged; when preceding consonants, they both of them tend towards the pronunciation of the French 'j'; hence in that position they are often confounded with one another and with *sh*.

Ex.: 'ichku' = goat, almost like 'ishku' (and, *vice versá*, the word *tapshurdi* has been found written *tapjurdi*).

Before vowels the distinction is better kept up.

Ex.: *chíqmáq, jabduq*.

ح H, a harsh guttural aspirate, but yet distinct from the following letter. The Eastern Turkistánís put below it the mark usually denoting the other oriental *h*.

خ Kh, the German *ch* (as in *machen*, not as in *ich*).

د D, the ordinary sound.

ر R, do. But the Yárkandís often swallow it altogether when it precedes another consonant, and sometimes in that case omit it even in writing.

Ex.: *arpa* = barley, pronounced *apa*; *irdi, irmas*, pronounced and often written *idi, imas*.

ز Z, the sound as in 'zeal.'

س S, the ordinary sound. The Túrkiís write this letter with three dots reversed beneath the letter.

ش Sh, the sound of the French *ch*, or the German *sch*, or of *sh* in the English word *shall*. (See remarks under J.)

ع the oriental letter 'ain', a sound inexplicable in writing.

- غ *Gh*, the oriental letter 'ghain', resembling in sound the Parisian 'r grassayó', or the Northumberland 'burr', sometimes interchanged with ق, *q* (see Chapter II, "Phonetic changes of Consonants").
- ف *F*, often interchanged in pronunciation, and even in writing, with *P*; as '*Fádshak*' for '*Pádshak*'; '*furwak*' for '*parwak*', and *vice versá*, '*pursat*' for '*fursat*'.
- ق *Q*, pronounced far back in the throat with a kind of choking effort. The Yárkand pronunciation of it is rougher than that of the Persians. Sometimes interchangeable with غ *gh* (see "Phonetic Changes").
- ك *K*, the ordinary sound, as in the English word '*keep*'.
- گ *G*, the ordinary sound, as in *get*, never as in *gin*. *K* and *G* are sometimes interchangeable (see "Phonetic changes"), and in manuscript the second stroke is generally omitted.
- نگ *ng*, is pronounced as in English, but the *g* is not separately or distinctly sounded even before a vowel. The pronunciation is that of "*hanger*", not of "*anger*".
- ل *L*, the ordinary sound.
- م *M*, do.
- ن *N*, do.
- و *W* or *O* or *U*. As a consonant, the same as the English *w*. As a vowel, there are four varieties of pronunciation, not distinguished by any difference in the vernacular writing, *viz.* :—
- O*, as in *bone*.
- Ö, (German sound). Ex.: *kön* (day) rhymes with G. *schön*, but is pronounced a little shorter.
- U*, (English *oo*). Ex.: *bu*, (this) pronounced *boo*.
- Ü, (French *u*) or German *ü* or *ue*. Ex.: *ülmak* (to die): the sound of *ü* in German '*über*'.
- ه *H*, the common aspirate.
- ي *Y* or *E* or *I*. As a consonant, pronounced like the English *y*; but the Yárkandís often give it a slight sound of the French *j*: as *yüz* (side), pronounced '*jüz*' (French *j*), and *iké* (two), pronounced *ijké*. As a vowel, either long *è* (the French sound in "*père*", the same as the English diphthong *ay*), or short as in *then*; or else *i* (either short as in '*bit*,' or long as in '*machine*').

THE VOWEL MARKS.

The Eastern Turkistání written language possesses, though it seldom uses, the ordinary Oriental vowel marks. The entire system of spelling is

in theory that of the Arabic alphabet ; but as this system is a foreign adaptation, and not a home-growth (for the Eastern Túrki existed both in a spoken and in a written form before the introduction of Arabic into the country), we find many traces of imperfect fitting between the language and the writing that conveys it.

Even in books we meet with the same word spelt in different manners ; but more especially is the divergence apparent in the want of distinction between the sounds represented by the short vowel marks “zabar” (—), “zer” (—), and “pesh” (—), and by the long vowels “alif” (ا), “ye” (ي), and “wáo” (و) respectively. These latter are often pronounced short, *e. g.* : دین pronounced *din* (from) as though written دِن, while in Persian it would be pronounced *dín* (faith). The “pesh” over a consonant is often pronounced like an *i* : *e. g.*, تُش *tüsh*, pronounced *tish* (tooth).

The Yárkandís on the whole seem to use the oriental vowels much like we use our own. That is, they rather ignore the system of vowel-sounds as inherent in consonants, and consider a written vowel almost necessary to complete a syllable, whether long or short.*

CHAPTER II.

PHONETIC VARIATION.

The Root of a Verb never changes in any formation ; nor does any Substantive† or Adjective. But there are numerous syllables capable of being affixed, whose vowels and consonants vary with those of the word they are attached to, according to certain general rules which are not without exceptions.

A somewhat similar fact in European languages (as regards the consonants) is the change of the Latin prefix *ad* into *ac* in the word *accept*, into *at* in the word *attain*, and into *af* in the word *affix*, &c.

* I have found خابر spelt خبر, &c.

† Excepting when a final *q* or *k* softens into a *gh* or *g* respectively before an affix. See p. 256.

The guiding principle of the Túrki variation seems to be this: that the mouth and throat having assumed a certain shape for the pronunciation of certain sounds, it is difficult in the compass of the same word to shift the position of the organs; or, when a hard breath is coming out, to change it suddenly into a soft breathing; and *vice versâ*.

Thus, if the throat has been put into the half choking state necessary to pronounce the 'ghain' (*gh*) or the 'qáf' (*q*), and another guttural comes immediately afterwards, it is difficult to prevent this being sounded with the same choking effort (or, in other words, it is difficult to shift forward suddenly the place of utterance); and *vice versâ*.

Thus it will be found comparatively easy to pronounce *sarigh-qul* (where two choking gutturals follow one another); but a difficulty will be found in trying to say consecutively *reg gum* (the Persian and the Túrki words respectively for 'sand'), where the contact between the root of the tongue and the back part of the palate (for the *g*) has to be shifted suddenly back into the throat for the *q*; and still more difficult to give the proper sounds to each of the so-called gutturals in the following compound: *âq kupruk* ("white bridge"), where the initial *k* will almost inevitably retain some of the choking *q* sound, unless a fresh breath be taken.

An effort is required, and this the Túrki avoids.

Thus, (a) *Gutturals (so called) of either class*, which may be roughly designated as common [*k* and *g*], and true (choking) [*q* and *gh*], when contained in a root *tend to bring any guttural contained in an affix into the same class*.

So again, when one has pronounced the syllable *yet*, it is easier to complete the word with a *t* than with a *d*. Thus *yet-di* becomes changed into *yet-ti*, for the same reason that *cup-board* has become *cubboard* in English pronunciation. So *pit-gan* becomes *pit-kan*.*

On the other hand after the liquids *r* and *l*, which only require a soft utterance, it would require a fresh effort of the breath to bring out the hard sounds of *k*, *q* or *t*, so *g*, *gh* or *d* are used.

Ex.: *bâr-ghan* "going"; *kel-di* "he came".

Thus, (b) *Hard consonants at the end of the root tend to harden the utterance of the guttural or dental of the affix, and vice versâ*.

* * * * *

The principle is the same in the case of the vowels. When the tone of a word, as it were, is in *u* (*oo*), say, the Túrki continue that sound, or one complementary to it, in certain of the affixes.

* See *post*, Specimen pieces (copy of Passport): "*Yárkand-ga khidmat-ka*." Here *ga* and *ka* are the same word, but the initial guttural is softened after the final *d* of *Yárkand*, and hardened after the final *t* of *khidmat*.

Ex. : *ur-dum* not *ur-dim*
tösh-lök not *tösh-lik*.

Such are the principles on which the practice seems to rest. The following are generally the rules by which these principles work ; but they must be considered rather as tendencies than as rigid laws, and they only act where no other consideration interferes.

It is not all affixes that are liable to variation. Some seem to partake of the unchangeable nature of the roots. The particular affixes which are liable to phonetic variation will be pointed out in the following pages.

PHONETIC VARIATIONS OF CONSONANTS.

FINAL LETTER OF ROOT (Simple or Compound).	CONSEQUENT INITIAL OF AFFIX.		
	Guttural.		Dental.
	Usually after <i>t, k, g, n</i> , in body of Root.	Usually after <i>b, p, ch, d, s, m,</i> <i>l, y, q</i> , in body of Root.	
	<i>ordinary.</i>	<i>choking.</i>	
a, d, e, g, h, i, j, l, m, n, o, r, u, z, Ex. 1, (See below).	g or	gh	d <i>Soft</i>
	or	or	
ch, k, q, p, s, sh, t. Ex. 2, (See below).	k or	q	t <i>Hard</i>

[*N. B.*—If the root ends with either of the consonants with which the affix *may* begin, there is simply a re-duplication.

Ex. : *tig-gan* not *tig-kan*.]

Ex. 1 : *sakla-ghan*, *sakla-di*, from *sakla-mak* = to take care of.

kel-gan, *kel-di*, from *kel-mak* = to come.

qel-ghan, *qel-di*, from *qel-màq* = to do.

tut-ma-ghan, from *tut-màq* = to seize.

kön-ga, "to a day", *yol-gha* "to a road".

Ex. 2 : *ishit-kan*, *ishit-ti*, from *ishit-mak* = to hear.

ket-kan, *ket-ta*, from *ket-mak* = to go.

kech-kan, *kech-ti*, from *kech-mak* = to pass over.

qàch-qan, *qàch-ti*, from *qàch-màq* = to flee.

tish-ka, "to a tooth", *yàsh-qa*, "to an age".

Thus, in the above examples the final letter *l* of the root *kel* determines that the initial letter of the participial affix shall be a *soft* guttural (*g* or *gh*) rather than a *hard* one (*k* or *q*); while the *k* of the same *kel* determines which of the two soft gutturals should be chosen, *viz.*, the *ordinary* one *g*, and not the *true* (choking) one *gh*.

On the other hand, in the example *gel-ghan*, while the letter *l* again compels the choice of a *soft* guttural, the other root-consonant *g* necessitates the adoption of the *true* (choking) soft guttural *gh* rather than of the *ordinary* one.

In *ket-kan* again, we have the *hard* guttural induced by the final *t* of the root, while the other root-consonant *k* being *ordinary*, determines that the hard guttural used in the affix shall be of the same class.

It will be seen that there is a cross division of the gutturals; 1st, into *soft* (*g* and *gh*), and *hard* (*k* and *q*); 2nd, into *ordinary* (*g* and *k*), and *true* (choking) (*gh* and *q*).

Thus the rules given above may be re-stated in other words, *viz.*, that the *former* of these cross divisions is the one affected by the final letter of the roots, while the *latter* division is that over which the other letters of the root bear rule.

In the dentals there is only a simple division into soft and hard (*d* and *t*), affected only by the final letter of the root.

Any word ending in a *k* or *q* softens the final letter into *g* or *gh* respectively before an affix beginning with a vowel (and sometimes even before consonants). Ex. *kunglak* "a coat", *chaukan kunglag-i* "a young woman's coat"; *sariq* "yellow", *Sarigh-chopan* (the name of a place).

It may be added that the letter *q* seems to have a certain affinity to the broad sound of *d*, and the letter *k* to its short sound (almost like an *e* as in the English word *hat*). Thus *ماق* (*māq*) is pronounced almost like "*mock*," while *ماك* (*mak*) is pronounced as in "*MacAndrew*" (almost *mec*).

On the other hand, the vowel *e* seems to take its broad sound with the *k*, and its short sound with the *q*: *e*: *g*: *kel-mak* "to come" (pronounced almost "*cail-mec*"); and *qel-māq* "to do" (pronounced almost "*kill-mock*").

PHONETIC VARIATION OF VOWELS.

1. Whenever the affix begins with a Vowel and the Root ends with one, the latter prevails.

Ex.: *achku'm* (*achku* = key, and 'm possessive affix of 1st Person).

N. B.—With a final diphthong there is no elision; the chief vowel

(see Rule 2) induces the corresponding vowel for the affix. Ex. : 'tûi-üp'.

2. In all other cases the affix assumes a vowel corresponding with the chief Root vowel, as follows :—

Root Vowel or Diphthong.	Corresponding Vowel for Affix.
1. <i>a ai</i>	<i>i</i>
2. <i>e</i>	<i>i</i>
3. <i>i</i>	<i>i</i>
4. <i>o</i>	<i>u</i>
5. <i>ö</i>	<i>ö</i>
6. <i>u</i>	<i>u</i>
7. <i>ü</i>	<i>ü</i>
8. <i>oi</i>	<i>u</i>
9. <i>ui</i>	<i>i</i>

Ex. (1). *tila-dim* [*tila* (verb-root) and *d'm* (affix of 1st person Past)].

(5). *kör-döm* [*kör* (verb-root) and *d'm* (affix of 1st person Past)].

(1). *tâp-ip* [*tâp* (verb-root) and *'p* (affix Perf. Participle)].

(2). *kel-ip* [*kel* (verb-root) and *'p* (affix Perf. Participle)].

(4). *soq-up* [*soq* (verb-root) and *'p* (affix Perf. Participle)].

(7). *tûi-düm* [*tûi* (verb-root) and *d'm* (affix of 1st person Past)].

(2). *ket-ing* [*ket* (verb-root) and *'ng* (affix 2nd person)].

(6). *qum-luq* [*qum* = sand, *'q* (substantival affix)].

(1). *bâsh-lik* [*bâsh* = head, *'k* (substantival affix)].

(6). *yük-üng* [*yük* = baggage, *'ng* (affix 2nd person)].

(4). *yöl-nung* [*yöl* = road, *n'ng* (affix genitive case)].

(6). *âzuq-umiz* [*âzuq* = food, *'miz* (possessive affix 1st pers. Plural)].

(1). *gunâh-imiz* [*gunâh* = sin, *'miz* (possessive affix 1st pers. Plural)].

If there is more than one affix, each is affected by the preceding one as if this were the Root (both as to *consonants* and *vowels*).

Ex. 1 : 'tut-ma-ghan' ; 'tut-al-ghan', (without the affix *ma* or *al* interposed, the last affix would take the form *tut-kan*). So *yört-öng* with the affix *lar* interposed becomes *yört-lar-ing*, not *-öng*.

2. 'bil-mang' ('bil-ma-'ng') ; 'kel-tur-up' ('kel-tur-'p') (Cf. *bil-ing*, *kel-ip*). Often the first affix has itself been affected by the Root. Ex. : 'bil-in-ip', 'tut-ush-up.'

CHAPTER III. THE SUBSTANTIVE.

The PLURAL of Túrki words is formed by affixing the syllable *lar* (which does not vary phonetically) ; and whenever this syllable occurs with a Substantive, it comes immediately after the root or radical portion of the word, which root is in every case inalterable.*

Ex. : *át-lar* = horses (from *át* = a horse).

ata-lar = fathers (from *ata* = a father).

There are no ARTICLES in Túrki Grammar.

There is no difference of GENDER in Túrki.

Besides the above, two other sets of attached syllables or affixes are taken by the Substantive:—

(a). The first set is that of the POSSESSIVE Terminations. They are affixed to Substantives, &c., governing other substantives or pronouns in the genitive case, in the manner that will be seen below.

SINGULAR.	POSSESSIVE AFFIXES.	EXAMPLES.
1st person	'm†	<i>át-im</i> = my horse ; <i>put-um</i> = my foot ; <i>ata-'m</i> = my father. See the Rules of Phonetic variation (vowels).
2nd „	'ng	<i>yer-ing</i> = thy place ; <i>achku-'ng</i> = thy key. (Vowel variable.)
3rd „	<i>i</i> or <i>si</i>	<i>yol-i</i> = his (her or its) road ; <i>ata-si</i> = his (or her) father. The vowel <i>i</i> is used after a consonant and <i>si</i> after a vowel or a silent <i>h</i> termination.
PLURAL.		
1st person	'miz	<i>üz-'miz</i> = our house ; <i>át-imiz</i> = our horse. (Vowel variable.)
2nd „	'ngiz or 'nglar	<i>qiz-ingiz</i> = your daughter ; <i>yört-önglar</i> = your country. (Vowel variable.)
3rd „	<i>i</i> or <i>si</i>	<i>yört-i</i> = their country. (Same as 3rd person Singular.)

* Except by the softening of a final guttural *k* or *q* into *g* or *gh* before an affix. See p. 256, at bottom.

† The apostrophe marks the place of the variable vowel in the affixes ; 'm therefore is a general form to express *im*, *um*, *öm*, &c.

As before mentioned, the Plural affix of the noun, where employed, precedes these (as well as any other) affixes.

Ex. : *át-lar-im* = my horses.

yört-lar-ing = thy countries [to be distinguished from *yört-önglar* = your (Pl.) country.]

yört-lar-inglar or *yört-lar-ingiz* = your countries.

Again :—*yol-i* = his (her, its or their) road.

yol-lar-i = his (her, its or their) roads.

These Possessive Affixes are merely subsidiary to the regular Possessive Pronouns (or Nouns in the genitive, in the case of the 3rd person), which, as in European languages, precede the governing Nouns. This will be further treated of in the Chapter on Pronouns.

(b). The second set of Affixes that may be attached to Nouns answer the purpose accomplished by declensional inflections and by prepositions in the classical and modern languages of Europe. For the sake of clearness they will be here classed under the ordinary declensional headings or cases; though these Affixes have not yet grown into the words they are attached to, as in the inflectional languages, but remain separate POST-POSITIONS.

CASES.	SUBSTANTIVE.	POST-POSITIONS.	ENGLISH.
Nominative	<i>át</i>	...	a horse.
Genitive	<i>át</i>	<i>ning</i> [<i>nung</i> or <i>nang</i>]*	of a horse.
Dative	<i>át</i>	<i>gha</i> [<i>qa</i> , <i>ka</i> or <i>ga</i>]†	to a horse.
Accusative	<i>át</i>	{ 'n (Possessive) —'s horse. ni	a horse.
Locative	<i>át</i>	<i>da</i>	in (or at) a horse.
Ablative	<i>át</i>	<i>din</i> [or <i>dan</i>] <i>birla</i> or <i>bilan</i>	from a horse. with a horse.
		&c., &c.	

N. B.—The Possessive form of the Accusative is employed as a Possessive Affix of the 3rd person only.

Ex. : *Pàdsháh-ning át-in alip-keł*, Bring the king's horse.

Any of these Post-positions (Sec. b.) may be agglomerated on to the end of any of the Possessive Affixes (Sec. a.) going through the whole declension with each of the latter.

Ex. : *yol-um-nung*, *yol-um-ga*, *yol-um-ni*, *yol-um-da*, &c., *át-lar-imiz-din*, &c.
road my of, road my to, road my (acc.), road my in horse (pl.) our from
The order in which the Affixes treated of in this Chapter take their

* See "Phonetic Variation of Vowels." The Yarkandis have a preference for the form *nang*.

† See "Phonetic Variation of Consonants."

places (when present) after the Noun, is as follows: 1st, Noun; 2nd, Plural Affix; 3rd, Possessive Affix; 4th, Post-position.

Ex.: *üi-lar——i——ning* = of his houses.

(Noun) (Pl. Aff.) Poss. (Post-pos.)

qiz-lar——ingiz——ga = to your daughters.

(Noun) (Pl. Aff.) (Poss. Aff.) (Post-pos.).

Sometimes the Genitive post-position *ning* is omitted, and only the Possessive affix of the other noun retained, *i. e.*, two nouns are placed in apposition, the latter of them in the *possessed* form of the 3rd person; this is done when the compound is a common one in frequent use, as in English "house-door", door-key", "sun-light."

Ex. *näs kutu-si* = "a snuff-box" (for *näs-ning kutu-si*):

Qol kap-i = "a hand-cover" (*i. e.* glove).

Yuz-bâsh-i = a centurion, lit. "the head of a hundred."

Note.—DERIVATION OF THE DECLENSIONAL AFFIXES OF THE GENITIVE AND ACCUSATIVE. The affix of the GENITIVE may be represented (as has been seen above) by the formula *n'ng*, which becomes *ning*, *nung*, &c., according to the vowels of the word that it is affixed to. Now I imagine that this may be originally the same as the substantive *neng*, which in the ancient form of Túrki called UIGHUR means "thing" or "property." [See Vámbéry's "Uigurische Sprachmonumente", Vocabulary, p. 208.] In order to express the idea of the genitive, *e. g.*, to say "the Chief's horse", the Túrki would find the mere apposition of the word *Bêg* "Chief", by the side of the word *âti*, "the horse (his horse)", insufficient to discriminate between possessor and possessed; so they would label off the owner by the affixing of the word "*neng*", meaning "property".

Thus they would say "*Bêg neng âti*", which would mean "Chief property the horse". Here "Chief-property" or "Chief's property" would be the general description of the class of things to be denoted, amongst which one thing is afterwards more particularly designated by saying "the horse". Thus we first get the *genus* (genitive), and then the particular individual in that genus. [See Max Müller's "Lectures on Language," Vol. I, p. 114, Fifth Edition ".....*casus generalis*, the general case, or rather the case which expresses the *genus* or kind. This is the real power of the genitive."]

A more uncertain derivation is that of the ACCUSATIVE affix *ni*. The same syllable also forms the Túrki word for "that" or "what (that which)". Thus *ât-ni mindi* may perhaps be really "horse that-which he rode"; *nan-ni yedur*, "bread that-which he is eating", *i. e.*, "he rode a horse", "he is eating bread". The affix *ni* thus would point out the object of the verb; its subject being left undistinguished, as it is indicated by the affix of the verb itself.

POSSESSIVE AFFIX, 3RD PERSON. It has been seen above that the Possessive Affixes corresponding to the several persons are as follows :

1st *yol-um* = my road.

2nd *yol-ung* = thy road.

3rd *yol-i* = his road.

In the Accusative, however, as we have also seen, there is another Possessive Affix of the 3rd Person.

1st *yer-im-ni* = my land (acc.), or *yol-um-ni* = my road (acc.)

2nd *yer-ing-ni* = thy land (acc.), *yol-ung-ni* = thy road (acc.)

3rd *yer-in* = his land (acc.), *yol-un* = his road (acc.)

as well as *yer-i-ni*, *yol-i-ni*.

It seems that this same Possessive Affix of the 3rd person was formerly used in all the oblique cases (not the accusative only). The following expressions have been found in an old verse :—

Turkistán-ning yer-in-da khâli imas erân-lar.

Har bir gulach yer-in-da yâtur mardân erân-lar.

“ In the land of Turkistán there is no lack of heroes.

In every fathom of its soil there lie heroic men.”

Thus in old Túrki the Possessive Affixes (at least for the oblique cases) ran thus :—

1st ——— ‘m

2nd ——— ‘ng

3rd ——— ‘n

a usage not yet quite obsolete in Eastern Turkistán and which seems to have been generally retained in the more Western dialects.

CHAPTER IV. THE ADJECTIVE.

The Túrki ADJECTIVE does not change at all, either for the different cases or for gender or number.

Further details regarding it will be found under the heads of “FORMATION” and “SYNTAX”.

The COMPARATIVE of Adjectives (and Adverbs) is obtained by adding the affix *rak*, *râq* or *rák* :

Ex. : *obdân* = good ; *obdân-rák* = better.

The SUPERLATIVE is generally formed by inserting the object of comparison (or at least the word *hamah* = “all”) in the genitive and putting the adjective* into the *possessed* form (3rd person).

* This adjective thus becomes for the nonce a substantive : “the best” = “the one who is best.”

Ex.: *Muhammad-ning din-i hamah din-lar-ning ulugh-i* = Muhammad's Faith (is) the great (est) of all Faiths.

Bu hamah-si-ning chung-i = (lit.) "This (is) the big(gest) of all of them"; or as we should say: "This is the biggest".*

Hamah at-lar-ning yakhshi-si alip-kel = (lit.) "Bring the best of all the horses, i. e. "Bring the best horse."

The DIMINUTIVE is formed by the affix *ghana* (both the *gh* and the first *a* being subject to Phonetic variation).

Ex.: *kichik-kina* = tiny little.

khush-ghana = rather happy.

THE PRONOUN.

The PERSONAL PRONOUNS are, in the Singular: *man* = I, *san* (or *sen*) = thou, *ul* = he, she or it; and in the Plural: *biz* (or *bizlar*) = we, *siz* (or *sizlar*) = you, *ular* (for *ul-lar*) = they.

N. B.—As, in polite conversation, the forms *biz* and *siz* are often used with reference to a single person (like our word *you*), the other forms *bizlar*, *sizlar* are employed, when there might be a doubt, to denote plurality.

These pronouns receive the affixes of the different cases exactly in the same way as substantives do [Substs. Sec. *b*.]

Ex.: NOM. *man* I

GEN. *man-ning* or *maning* of me

DAT. *man-ga* to me

ACC. *man-ni* or *mani* me

LOC. *man-da* in me

ABL. *man-din* from me, &c., and the others in like manner.

However, the 3rd Person Singular changes the *l* into an *n* before the Gen., Dat., and Loc. affixes, and before the Abl. affix *din*, viz., *un-ning* or *uning*, *un-ga*, *un-ni* or *uni*, *un-da*, *un-din* (instead of *ul-ning*, *ul-ga*, &c.). Before *birla* and some other post-positions, it takes the Gen. form viz., *uning birla* = "with him (in the unity of him)."*

In the oblique cases *an* is often used for *un*; as *aning* instead of *uning*.

The POSSESSIVE PRONOUNS are simply the Personal Pronouns with the genitive affix, viz.—

Maning = my; *saning* = thy; *uning* or *aning* = his* or her; *biz-ning* or *biz-lar-ning* = our; *siz-ning* or *siz-lar-ning* = your; *ular-ning* = their.

* In speaking of persons, the *genitive* of this pronoun is generally used before any of the post-positions, e. g., *uning-ga* = to him (instead of *un-ga*); *uning-din* for *un-din* [not with the Acc. post-pos., however]. Compare Vámbéry's "Uigurische Sprach-monumente", p. 35, where a similar rule is mentioned as prevailing in the ancient tongue of Uigurs. The same also sometimes takes place with *man* and *san* (I and thou).

We have already seen (Subst., Sec. a) that there is a set of possessive terminations or affixes of each person applicable to nouns. These possessive terminations are not generally of themselves sufficient to take the place of the ordinary possessive pronoun (or noun in the genitive). These also are frequently used and come before the noun, as in the following Table :

POSSESSIVE

Pronoun.	Noun Termination.
my	= <i>maning</i>.....'m
thy	= <i>saning</i> 'ng
his, her or its	= <i>uning</i> or <i>aning</i> (or —* <i>ning</i>).....i or si
our	= <i>biz-ning</i> 'miz
your	= <i>siz-ning</i> 'ngiz or -'nglar.
their	= <i>ular-ning</i> (or —* <i>lar-ning</i>).....i or si

Ex.: *maning ât-im*; *saning yer-ing*; *tâgh-ning yol-i*; *biz-ning üi-'miz*;
 mo of horsemy theof placethy mountain of road its usof house our
siz-ning qiz-ingiz; *ular-ning yört-i*.
 you of daughter your them of country their.

As before, the post-positions of the various cases may be affixed to these compounds as may be necessary.

Ex.: *maning ât-lar-im-din* = from my horses.
 mo of horses my from

DEMONSTRATIVE PRONOUNS: *ul* or *u* = that there (or he); *shul*, or *shu* = that here; *bul* or *bu* = this; *shu-bu* or *ush-bu* = this very, &c. These, when used before a substantive, are indeclinable, as adjectives. But when used alone, they receive the usual affixes of case and number, like a Noun or a Personal Pronoun.

In the oblique cases of the Singular, the *l* of *ul*, *shul* and *bul* changes into an *n* (which vanishes before another *n*); while the *b* of *bul* becomes *m* in those cases.

SINGULAR.

PLURAL.

Ex. : Nom. <i>shul</i> or <i>shu</i>	<i>bul</i> or <i>bu</i>	Nom. <i>shu-lar</i>	<i>bu-lar</i>
Gen. <i>shu'-ning</i>	<i>mu'-ning</i>	Gen. <i>shu-lar-ning</i>	<i>bu-lar-ning</i>
Dat. <i>shun-ga</i>	<i>mun-ga</i>	Dat. <i>shu-lar-ga</i>	<i>bu-lar-ga</i>
Acc. <i>shu'-ni</i>	<i>mu'-ni</i>	Acc. <i>shu-lar-ni</i>	<i>bu-lar-ni</i>
&c.	&c.	&c.	&c.

ADJECTIVAL PRONOUNS. Under this head may be classed the compounds formed by other Pronouns and the affixes *dak*, *dâq* or *dâgh* and *cha*. The former of these is the same as the affix *dik* (in common use), and implies "likeness." The second, *cha*, expresses "amount" or "extent."

* This blank represents a noun.

Exs. of the former : *mun-dàgh* = this-like.

shun-dàgh = that-like, such.

Exs. of the latter : *mun-cha* = this amount, this much.

shun-ga-cha = to that amount, so much.

and combined : *an-dàgh-cha* = to an amount similar to that.

Used as Adjectives, these are indeclinable ; but they are also sometimes employed alone, in which case they take the usual post-positions. [They are also employed as Adverbs.]

The particle *ki* or *gi* is used almost as a Pronoun. It answers to the Hindustání "walla." Thus *maning-ki* = mine, *Bàdsháh-ning-ki* = the King's. It therefore takes the place of some noun which is understood between the speakers. It receives the usual post-positions ; for instance, if a horse is in question, one may say "*Kim-ning-ki-ga mindi*" = whose did he ride ? "*maning-ki-ni urdi*" = he struck mine. The English word "one" most nearly expresses it : "the *one* belonging to me," &c.*

We shall see in the Syntax that this (or its parallel forms *gi* or *ghi*) takes the place of a relative pronoun in subordinate sentences.

INTERROGATIVE PRONOUNS are *kim* = who ? ; *ni* = what ? The latter with the addition of the interrogative affix *mu* or *ma*, makes *ni-ma* = what ? ; with *cha* it makes *ni-cha* = how much ? ; with the Persian *chand* it makes *ni-chand* = how many ?

Again a number of these words are derived from an obsolete *qäi* = which. Thus, with the possessive affix, *qäi-si* = which or who (of them) : *qäi-dàq* = what like ?

Probably as corruptions of these have arisen the forms *qän-dàgh* = what like ? and *qän-cha* = how much ?

Several adverbs also are derived from *ni* and *qäi*.

All these interrogative pronouns (excepting *ni*) take the usual affixes.

Ex. : *qäi-si*-*'miz* "which of us"

'nima-ni aitti "what said he ?"

*

*

*

INDEFINITE PRONOUNS are *kim-ersa†* = some one ; *nim'-ersa†* = something, also *ni-ersa†* = something ; *ni-chand* = a certain number ; *kishi* = somebody, also used substantively for "a person ;" *hama* (P) and *hama-si* = all, or the whole (of it or them).

* This also is an old Uigur form. See Vámbéry's "Uigur. Sprach-monumente", p. 35.

† Perhaps compounded with *irsa* "may be" [the Potential of *irma*]; thus *kim-ersa* would be "who (ever it) may be," *ni-ersa* "what (ever it) may be." See Kudatku Bilik, Introd., *hargiz kim irsa*, *gelmai-turur* "whosoever he may be...he does not make" ('qui que ce soit...ne fait.')

REFLECTIVE PRONOUN: *öz* = self, is used instead of the Demonstrative or Possessive Pronoun when this pronoun refers to the person or thing which is the subject of the sentence [like the use of *khud* in Persian, and *áp*, *apna* in Hindústání]. The Reflective Pronoun is affected by the possessive affix of each person, and by the post-positions, where necessary; and if it is governed in the genitive by a noun, that noun takes the possessive affix of the same person:

Ex. : *öz-öm-ning át-im* = my own horse.

self my of horse my

öz-öngiz-ning gört-lar-ingiz-ga = to your own countries.

self your of country (pl.) your to

Sometimes the possessive termination and the genitive post-position are omitted from the *öz*.

Ex. : *öz ikhtiyar-im* = my own choice, for *öz-öm-ning ikhtiyar-im*.

When used merely like the word "self" in English, it takes the possessive terminations before the post-positions (if any) just like a noun.

Ex. : *öz-öm* = myself; *öz-öm-ning* = of myself, *öz-öm-ga* = to myself, &c.

öz-öng = thyself; *öz-öng-ning* = of thyself, *öz-öng-ga* = to thyself, &c.

öz-i = himself; *öz-i-ning* = of himself; *öz-i-ga* = to himself, &c.

[*Note.*—The *öz* being thus treated exactly like a substantive, suggests the possibility of its being merely a contraction of *yüz* = face; viz. "my face" for "myself."]

CHAPTER V.

T H E V E R B.

All verbs in Túrki, both primary and derivative ones, active or passive, &c., are conjugated on precisely the same model. One might cut out the radical part of any verbal form, and substitute that of any other verb for it, and, with the exception of trifling phonetic changes, the conjugational frame-work would fit on to the new as well as it did on the original verb-root.

The radical portion of the verb suffers no internal alteration whatever. The conjugation is entirely effected by various affixes which convey the necessary changes of application.

The foundation of the system is the *verb-root*, from which are formed, by addition, several verbal adjectives and substantives which take the place of participles, and refer to the various times or modes in which action can take place.

We will take as an example the verb signifying "to do," of which the root is QEL.

SIMPLE ROOT : QEL ; expresses the bare idea of doing.

PRESENT PARTICIPLE : QEL*a* ; answers to our own Pres. Part. "doing" [where the root ends in a vowel this Participle adds an *i* : as ISHLA, ISHLA*i* ; OQU, OQU*i*.]

PARTICIPLE OF CONTINUANCE : QEL*ár* or QEL*ur*. (See p. 297, note †.) This Participle seems to indicate a continuance or non-completion in the action of the verb, and is used, as will be seen, for all tenses requiring such a meaning.

PERFECT PARTICIPLE : QEL*ip* ; here the vowel of the affix varies phonetically in different verbs, and the general expression for the Perf. Part. affix would be 'p, the apostrophe being replaced by the proper vowel in each case (see "Phon. Var. of Vowels"). This Participle implies the completion of the action.

INDEFINITE PARTICIPLE : QEL*ghàn* [The *gh* changes in different verbs into *g*, *k* or *g*. See "Phon. Var. of Consonants".] This Participle may properly be called Indefinite, both because it refers to no particular time for the action, and also because its application is not confined to either agent or object. In fact it may mean either the "person doing" (the doer), or the "act of doing," or the "thing done."

POTENTIAL PARTICIPLE : QEL*sa* "potential doing." [The vowel does not alter, but is always *a*.]

FUTURE PARTICIPLE : QEL*ghu*. [The *gh* changes as above.] This Participle only survives in composition with certain affixes which give rise to forms in modern use, of which the syllable "*ghu*," &c., supplies the future element. Thus with "*dig*," which implies probability, we get a

[**PARTICIPLE OF PROBABILITY** : QEL*ghu-dig*. This means "likely to do at a future moment."

PARTICIPLE OF FITNESS : Again, with the affix *luq* (*liq*) implying quality, we have QEL*ghu-luq*, which means "possessed of a do-able quality," i. e., "fit or proper to do, or to be done."]

These forms in themselves merely indicate a "coming to pass" in a general manner at the several times (or tenses) respectively, without connection expressed with any person or thing, either as subject or object. Even in this naked form, however, some of them may be used in making statements, where there cannot be much doubt about the application, especially in the 3rd person.

But usually, to give life to these dead forms, we require the pronouns. The addition of these at once suffices to convert a Participle* into a definite statement of fact, while at the same time they connect it with determinate subjects. Thus *qela* merely means "doing". But add the pronoun signifying "I," and you get the definite statement *qela-man* = I (am) doing.

The *Personal* Pronouns are used as affixes applied to such of the so-called Participles as are Verbal *Adjectives*, chiefly for the tenses denoting *present* or *future* action. But the *Possessive* Pronominal Affixes (attached to the Verbal *Substantives*) give either a *past* sense (since a completed action is most essentially the *property* of the person who has done it); † or else a sense either of *Duty* or of *Intention*, e. g., "It is *thine* to do," i. e., "do thou," or "it is *my* (intention) to do," i. e., "I mean to do."

To exemplify these formations we will first take two isolated tenses of auxiliary verbs, the first of which is used in a *present* sense, and the other in a *past*. These tenses will also be useful hereafter in the conjugation of a complete verb.

1st. *DUR* (or *TURUR*) is probably a part of the verb *TUR-mâq*, meaning "to stand;" the Indefinite Participle is *DURghan* for *TURUR-ghan*. There is also a form *DUR-mish*.

[*N. B.*—The form *dur* having, as it were, lost its independence, and become a mere auxiliary, meaning hardly more than "is" (see *N. B.* p. 276); the original verb *tur-mak* (Pres. *tura-man*, &c.) is sometimes brought in as a fresh auxiliary expressing "permanence."]

2nd. *IRD'* (or *ID'*) is the Past of a defective verb *IR-mak*, meaning "to be," of which the Indefinite Participle is *IRkan* or *ikan*, and the Potential Participle is *IRsa* or *isa*. It also possesses a form *IR-mish* or *imish*. The rest are absent, with the exception of a Continuative Participle *IRur* found in old books.

PRESENT AUXILIARY.

Here the simple *Personal Pronoun* is affixed for each person (except the 3rd):

8. 1. *DUR-man*‡ = (lit.) I stand.
2. *DUR-san* = „ thou standest.
3. *DUR* = „ (he) stands.

* Or any other Adjective &c., (see p. 296).

† Thus answering to the tenses formed with the auxiliary "to have" in modern European languages.

‡ The presence of the pronoun as a termination of the verb does not prevent its being used *before* the verb also, as the subject or nominative, e. g., *man dur-man* = "I stand" or "I am."

- | | | |
|--------|-------------------------------------|---|
| Pl. 1. | DUR- <i>miz</i> * = (lit.) we stand | or DUK- <i>miz</i> (dignified form used in Aksu, &c.) |
| 2. | DUR- <i>siz</i> = „ ye stand | DUK- <i>siz</i> . |
| 3. | DUR- <i>lar</i> = „ (they) stand | DUK- <i>lar</i> . |

N. B. It will be noticed that when the Pers. Pronouns are thus used as Tense-endings the Pronouns of the 3rd pers. are omitted. In the Singular the stem stands alone for the 3rd pers., and in the Plural, the mere affix of Plurality is added.

PAST AUXILIARY

with the *Possessive Pronominal* affix of each person added :

- | | | | | | |
|----|-------------------|--------------------------------------|--|---|---------|
| | 1 | 2 | | 1 | 2 |
| 1. | IRD- <i>im</i> | = I was ... (or) past existence [is] | | | mine. |
| 2. | IRD- <i>ing</i> | = thou wert „ | | „ | thine. |
| 3. | IRD- <i>i</i> | = he was „ | | „ | his. |
| 1. | IRD- <i>ik†</i> | = we were „ | | „ | ours. |
| 2. | IRD- <i>ingiz</i> | = ye were „ | | „ | yours. |
| 3. | IRD- <i>ilar</i> | = they were „ | | „ | theirs. |

[This word is pronounced *idim*, &c., dropping the *r*.]

There is another auxiliary verb BOL-*mâq* (root BOL) = to become or be. Its Continve. Participle is *bolâr* or *bolur*, &c. Its Potential Participle is, in regular form, BOL*sa*. Also note a defective verb in the 3rd person singular, *viz.*, “*bûr*” = there is.

We have thus as materials out of which to form the Verb-Conjugation, on the one hand 7 *Stem*-elements (Root and Participles, see above), and on the other 10 *co-efficient* elements :—

* Note that *biz* takes the form *miz* when used as a verbal termination. This is a beginning of the process by which the Osmanli personal tense-terminations have become differentiated from their originals, the Personal Pronouns.

† This ‘*k*’ is an abnormal form used instead of the possessive affix of the 1st person plural ‘*miz*’. Now this is the only one of the six persons whose possessive affix cannot easily be distinguished from its affixed Personal Pronoun ; and this probably led to the substitution of another form for the former in the case of verbs, to avoid confusion in the first person plural, between tenses ending with the Personal Pronoun and those ending with the Possessive Pronoun.

1. The Personal Pronouns *man*, &c.
2. The Possessive Affixes, *im*, &c.
3. The Auxiliary Tense, *dur-man*, &c.
4. The Aux. Tense *bolâr-man*, &c.
5. The Aux. Tense *id-im*, &c.
6. The Aux. Tense *imish-man*,* &c.
7. The Aux. Tense *durmish-man*,* &c.
8. The Aux. Tense *ikan-man*,* &c.
9. The Aux. Tense *irsa'm*,† &c.
10. The Aux. Tense *bolsa'm*,† &c.

Out of these simple materials, by adding each of the latter set in succession to each of the former (with certain omissions), almost the whole conjugation of every verb (with its seeming intricacies) is formed, as we shall now see.

* These are formed in the model of *dur-man*, &c., (with Pers. Pron.).

† These are formed in the model of *id-im*, &c., (with the Possessive Affixes).

SCHEME OF THE TURKI

	TENSES OF THE ROOT : QEL	TENSES OF THE PRE- SENT PARTICIPLE : QELA	TENSES OF THE CONTIN- UATIVE PARTICIPLE. QELÀR
1. With the Perso- nal Pronouns.		<i>The Simple Present Tense.</i> QELA-man, &c., = I do, &c.	<i>The Future-Present Tense.</i> QELÀr-man, &c., = I am about doing, &c.
2. With the Posses- sive Affixes.	<i>Imperative.</i> QEL-ing (2nd person) = do thou.		
3. With the Auxili- ary dur-man.		<i>Compound Future Present Tense.</i> QELA-dur-man, &c. = I am about doing.	.
4. With the Auxili- ary bolàr-man.			.
5. With the Auxili- ary id-im.	<i>Definite Past Tense.</i> QEL-'d-im, &c., = I did.		<i>Habitual or Imperfect Tense.</i> QELÀr-id-im, &c., = I was doing (used to do).
6. With the Auxili- ary imish-man.		<i>Hearsay Present Tense.</i> QELA-imish-man, &c., = I am understood to do.	<i>Hearsay Future-Present Tense.</i> QELÀr-imish-man, &c., = I am understood to be about doing.
7. With the Auxili- ary dur-mish- man.		<i>Hearsay Compound Present Tense.</i> QELA-durmish-man, = I am understood to be doing.	
8. With the Auxili- ary ikan-man.			<i>Future-Present Indefi- nite Tense.</i> QELÀr-ikan-man, &c., = I may be about do- ing.
9. With the Auxili- ary irsa'm.			<i>Future-Present Poten- tial.</i> QELÀr-irsa'm, &c., = I might be about doing.
10. With the Auxili- ary bolsa'm.			

VERB CONJUGATION.

TENSES OF THE PERFECT PARTICIPLE: QELIP	TENSES OF THE INDEFINITE PARTICIPLE: QELGHAN	TENSES OF THE POTENTIAL PARTICIPLE: QELSA	TENSES OF THE FUTURE PARTICIPLE: QELGHU (QELGHU-DIQ). (QELGHU-LUQ).
<i>The Perfect Tense.</i> QELIP-man, &c., = I have done, &c.	<i>The 1st Indefinite Past Tense.</i> QELGHAN-man, &c., = I have done, &c.		<i>Probable Future Tense.</i> QELGHU-diq-man, &c., = I am likely to do, &c.
	<i>The 2nd Indefinite Past.</i> QELGHAN-im-bár, &c., = I have done, &c.	<i>The Present Potential.</i> QELSA-'m, &c., = I may do.	<i>The Intentional Future.</i> QELGHU-'m dur, &c., = I intend to do.
<i>Compound Perfect Tense.</i> QELIP-dur-man, &c., = I have done, &c.	<i>Presumptive Past Tense.</i> QELGHAN-dur-man, &c., = I must have done, &c.		<i>Compound Probable Future Tense.</i> QELGHU-diq-dur-man = I am likely to do.
<i>Future Perfect Tense.</i> QELIP-bolár-man, &c., = I shall have done.			...
<i>Pluperfect Tense.</i> QELIP-id-im, &c., = I had done.	<i>Indefinite Pluperfect Tense.</i> QELGHAN-id-im, &c., = I had done.	<i>1st Past Potential.</i> QELSA-id-im, &c., = I might have done.	<i>Preterite Future Tense.</i> QELGHU-luq-id-im, &c., = I was to do or be done.
<i>Hearsay Perfect Tense.</i> QELIP-imish-man, &c., = I am understood to have done.	<i>Hearsay Past Tense.</i> QELGHAN-imish-man = I am understood to have done.		
<i>Hearsay Compound Perfect Tense.</i> QELIP-durmish-man = I am understood to have done.			
<i>Presumptive Perfect Tense.</i> QELIP-ikan-man, &c., = I must have done.	<i>Presumptive Indefinite Past Tense.</i> QELGHAN-ikan-man, &c., = I must have done.		<i>Future of Necessity.</i> QELGHU-luq-ikan-man = I am to do.
	<i>Indefinite Past Potential.</i> QELGHAN-bolá-'m, &c., = "I may have done."		<i>Future Potential.</i> QELGHU-diq-bolá-'m, = I may be likely to do.

N. B.—In the preceding Scheme the *stem*-elements occupy each its own vertical column, while the *co-efficient* elements run across the sheet, each in its own horizontal line. Only the 1st persons of the Tenses are given to save space.

SUPPLEMENTARY TABLE
OF THE
TURKI VERB CONJUGATION.

<i>Extra Tenses of the Root.</i>	<i>Complex Tenses.</i>	<i>Verbal Expressions.</i>
OPTATIVE OR FUTURE. (defective.)	(a) 2ND PAST POTENTIAL.	(a) QELish-im ni bair, &c., = I have to do, &c.
S. 1. QEL-aij = let me do, or I will do.	QELsa'm-idi &c., I might have done, &c.	(b) QELanâq-chi bol'dum, &c., = I have agreed to do, &c.
3. QEL-san = let him do.		
P. 1. QEL-ati or atig = let us do or we will do.	(b) 3RD PAST POTENTIAL.	
3. QEL-san-lar = let them do (qelsilla).	QEL'd-im-irsa, &c., = I may have done, &c.	(c) QELA-durghan bol'dum, &c., = I have determined to do, &c.
•		
OPTATIVE OR FUTURE. (complete.)	(c) 3RD PAST INDEFINITE.	(d) QELA-durghan-idim = I was to do.
1. QEL-ghai-man, &c. = I will do or let me do, &c.	QEL'd-im-ikan, &c., = I may have done.	(e) QELA-durghan-dur-man &c., = I am about doing.
	(d) COMPOUND FUTURE—PRESENT INDEFINITE.	(f) QELsa'm bolur-ikan, &c., = I should do, &c.
	QELA-dur-ikan-man, &c., = I may be doing, or about doing.	(g) QELsa'm bolur-idi, &c. = I should have done.
		(h). QELsa'm kirak, &c., = I must do.
	(e) FUTURE PRESENT PRETERITE.	(i) QELigh-liq-man, &c., = I am in a doing or done state.
	QELA-dur-id-im, &c., = I was about doing.	
	(f) CONTINUATIVE PLUPERFECT.	
	QELip-dur-id-im, &c., = I had been doing.	

CONJUGATION OF THE VERB,

with ANALYSIS.

I. PERSONAL PRONOUNS—

First applying the *Personal Pronouns* to each of the Participles in turn, we get :

(a) with PRESENT PARTICIPLE—

THE SIMPLE PRESENT TENSE.

- | | |
|---|-------------------------------------|
| 1. QELA-man = I do. | 1. QELA-miz = we do. |
| 2. QELA-san = thou doest. | 2. QELA-siz = ye do. |
| 3. (Caret, <i>see</i> Comp. Pr. Tense.) | 3. (Caret, <i>see</i> Comp. Tense.) |

*This is a *Simple Present* Tense;

(b) with CONTINUATIVE PARTICIPLE—

QELâr-man or QELur-man = (*lit.*) I (am) continuously doing.

This refers obviously both to the present moment and also to those immediately before and after it. In practice it has obtained special reference to the latter, like our English "I am going to do," and this Tense may therefore be called the *Future Present* :

1. QELâr-man or QELâr-man "I am doing" or "about doing."
2. QELâr-san "thou art doing" or "about doing."
3. QELâr "he is doing" or "about doing."
1. QELâr-miz "we are doing" or "about doing."
2. QELâr-siz "ye are doing" or "about doing."
3. QELâr-lar "they are doing" or "about doing."

(c) with PERFECT PARTICIPLE—

THE PERFECT TENSE.

1. QELip-man "I have done"; (*lit.*) "I (have) completely done."
2. QELip-san "thou hast done."
3. (Caret, *see* Compound Perfect Tense.)†
1. QELip-miz "we have done."
2. QELip-siz "ye have done."
3. (Caret, *see* Compound Perfect Tense.)†

Here there is no doubt about what the meaning must be. The tense is therefore a simple *Perfect* ;

(d.) with INDEFINITE PARTICIPLE—

* The 3rd pers. S. and Pl. being wanting here, the corresponding persons of the Compound Present Tense are made to supply their place.

† The 3rd persons of the Compound Perfect Tense supply the place of the lacking ones in this Tense.

QELghan-man, &c., (*lit.*) "I (was at some time or other) a doer." This is simply a general statement, and would be used in answer to the question: "Have you ever done so and so?" It would not be used to specify any particular action. It may be called

THE 1ST INDEFINITE PAST TENSE.

1. QELghan-man "I have done."
2. QELghan-san "thou hast done."
3. QELghan "he has done."
1. QELghan-miz "we have done."
2. QELghan-siz "ye have done."
3. QELghan-lar "they have done,"

(e.) with the PARTICIPLE OF PROBABILITY—

THE PROBABLE FUTURE TENSE.

1. QELghu-daq-man or QELghu-diq-man,* "I am likely to do."
2. QELghu-daq-san "thou art likely to do."
3. (Caret, *see* Compound Probable Future Tense.)
1. QELghu-daq-miz "we are likely to do."
2. QELghu-daq-siz "ye are likely to do."
3. (Caret, *see* Compound Tense.)

II. Having thus applied the Personal Pronouns all round, we proceed to do the same with Possessive Affixes, whose vowels (1st and 2nd Persons) vary phonetically according to the prevailing vowel of the root, as in the case of substantives.

POSSESSIVE AFFIXES—

(a.) with the ROOT—

QEL-ing = doing (is) thine=it is thy business to do; QEL-ing-lar = doing (is) yours, it is your business to do. This is therefore simply an *Imperative*, viz., "do thou" and "do ye." In this sense of course the 1st and 3rd Persons are not used. There is another Imperative form QEL-ghil or QEL-ghin; and, as in most languages, also a forcible Imperative, being the shortest possible form of the verb, viz., the Root: QEL = do.

THE IMPERATIVE.

- | | |
|---------|----------------------|
| | { QEL "do." |
| 2nd S. | { QEL-ing "do thou." |
| | { QEL-ghil do. |
| | { QEL-ghin do. |
| 2nd Pl. | { QEL-ingiz "do ye." |
| | { QEL-inglar do. |

(b.) with the INDEFINITE PARTICIPLE (and the auxiliary 'bár') :

* The 3rd pers. of the Compound Tense supply the lacking ones of this.

THE 2ND INDEFINITE PAST TENSE.

1. QELghan-im bâr "I have done."
2. QELghan-ing bâr "thou hast done."
3. QELghan-i bâr "he had done."
1. QELghan-imiz bâr "we have done."
2. QELghan-ingiz bâr "ye have done."
3. QELghan-ilar bâr "they have done."

Bearing in mind that the Indefinite Participle *qelghan* has among other meanings, that of "the action of doing," we can see very plainly the origin and intention of this formation. For ¹*qelghan-im-bâr*, must mean ²literally: "My ¹action of doing ³exists"; and it can be said to exist as the property of the doer by having been *done* by him. Hence the statement is equivalent to saying: "I have done."* But all the circumstances connected with the doing remain vague. The utmost that is predicated is that the action has not been omitted. Here it is to be noted that the possessive affix *im* changes for the several persons of the Tense while the auxiliary *bâr* remains throughout in the 3rd pers. The reason is obvious on inspection. The Tense is merely a sentence, of which *bâr* is the verb, while the subject takes successively the possessive form of the several persons. Thus the tense is literally a sentence with a varying subject. "My doing is," "thy doing is," "his doing is", &c. This forms a 2nd Indefinite Past Tense.

(c). with THE POTENTIAL PARTICIPLE :

This would mean "the power of doing (is) mine," *i. e.*, "I may," or "might, do." It is also used in relating a story sometimes, as an Historic tense: *E. g.*, *kelsam, hêch kishi yoq idi*=" (when) I came there was nobody (there)." The poss. terminations of the 3rd pers. are omitted. In the Singular the stem stands alone; and in the Plural, the mere affix of Plurality is added.

THE PRESENT POTENTIAL.

1. QELsa-'m "I may do."
2. QELsa-'ng "thou mayest do."
3. QELsa "he may do."
1. QELsa'q "we may do."
2. QELsa-'ngiz "ye may do."
3. QELsa-lar "they may do."

(d.) with the FUTURE PARTICIPLE :

* As the form ——— *im-bâr* means "there is of mine" or "I HAVE", the above tense is absolutely identical with the English "I have done," which expression is also to be accounted for in the same manner (as above).

qelghu-'m-dur (or bàr) &c. This is of course, literally, "my future doing exists (stands)" (for *qelghu*, it will be remembered, is the Future Participle); and as one may be said to make a future action one's own by *intending* it, this comes to mean: "I intend to do." [See latter remarks on (b).] This may be called

THE INTENTIONAL FUTURE TENSE.

1. qelghu-'m-dur or bàr "I intend to do."
2. qelghu-'ng-dur "thou intendest to do."
3. qelghu-si-dur "he intend to do."
1. qelghu-'miz-dur "we intend to do."
2. qelghu-'ngiz-dur "ye intend to do."
3. qelghu-si-lar-dur "they intend to do."

Having exhausted the usual combinations of the simple pronominal affixes with the several participial elements of the Verb, and formed thereby nine Tenses, viz., a *Simple Present*, a *Future Present*, a *Probable Future*, a *Perfect*, an *Imperative*, two *Indefinite Pasts*, a *Present Potential* and an *Intentional Future*; we now have recourse to the auxiliaries.

III. AUXILIARY: DUR—

First, the Present Auxiliary *dur*.

[N. B.—This is perhaps a contraction from the verb *turmàq* "to stand," which would make its Continuative Participle *turur* and its Future-Present *turur-man*, which may have become shortened into *trur-man*, and then made into *dur-man*. What gives colour to this supposition is that *turur-man* has been found employed as an auxiliary in the place usually filled by *dur-man*. And this auxiliary must be a Future Present, for the form of a Simple Present would be *dura-man*, and not *dur-man*.]

Be this as it may, the auxiliary *dur* is used in a sense implying "to stand" or "be in a condition..." like the Italian "sta bene," "sta male" ("he *stands* well," &c., for "he *is* well.") In some connections (as with the Indef. Participle, &c.) it implies merely probability or presumption (and thus Futurity), in which sense it may be compared with our "I *stand* to win" (see *qelghan-dur-man*, *bàr-durman*, &c.). Thus we have:

(a.) with PRESENT PARTICIPLE—

qela-dur-man,* &c. = I stand doing or to do, I am in the condition of doing; or, as we should express it, "I am doing," or "about doing."

THE COMPOUND FUTURE PRESENT TENSE.

1. qela-dur-man "I am about doing."
2. qela-dur-san "thou art about doing."
3. qela-dur "he is about doing."

* Pronounced in Yárkand and Kúshghar "qela-doman," "—dōsan," "—dō," &c., and in Khotan "—toman," &c.

1. QELa-dur-miz "we are about doing."
2. QELa-dur-siz "ye are about doing."
3. QELa-dur-lar "they are about doing."

This therefore is a *Compound Future Present*; (see remarks on *qelâr-man*).

with the PERFECT PARTICIPLE—

(b.) QELip-dur-man,* &c., = "I am in the condition of completely having done"; or, "I have done."

This is

THE COMPOUND PERFECT TENSE.

1. QELip-dur-man "I have done."
2. QELip-dur-san "thou hast done."
3. QELip-dur "he has done."
1. QELip-dur-miz "we have done."
2. QELip-dur-siz "ye have done."
3. QELip-dur-lar "they have done."

(c) with the INDEFINITE PARTICIPLE—

QELighan-dur-man, &c.* = "I am in the condition of being indefinitely the doer." (For the Indefinite Participle has the meaning of "the doer" amongst others, and this is the only one here applicable.) This combination might be rendered "I stand as *or* for, the doer," and is used in the sense of "I must have done," or "I have probably done." See remarks under DUR. It may be called

THE PRESUMPTIVE PAST TENSE.

1. QELighan-dur-man "I must have done."
2. QELighan-dur-san "thou must have done."
3. QELighan-dur "he must have done."
1. QELighan-dur-miz "we must have done."
2. QELighan-dur-siz "ye must have done."
3. QELighan-dur-lar "they must have done."

(d.) with the PARTICIPLE OF PROBABILITY—

THE COMPOUND PROBABLE FUTURE TENSE.

1. QELghu-diğ-dur-man "I am (*or* stand) likely to do."
2. QELghu-diğ-dur-san "thou art likely to do."
3. QELghu-diğ-dur "he is likely to do."
1. QELghu-diğ-dur-miz "we are likely to do."
2. QELghu-diğ-dur-siz "ye are likely to do."
3. QELghu-diğ-dur-lar "they are likely to do."

* Pronounced in Yârkand and Kâshghar "QELip-" and "QELighan-doman," "*-dosa*n," "*-do*," &c., and in Khotan "*-toman*," &c.

IV. The auxiliary verb *bol-mâq* in the Future-Present Tense when applied to the Past Participle of a Verb also gives a Tense :

(a) *QEL-ip bolâr-man*, or *bolur-man* &c. = "I shall have done," lit. "I shall be or become (in the condition of) having done."

This is the *Future Perfect* Tense.

V. Next we take the Past Auxiliary *irdi* or *idi*, and apply it to the several radical elements.

AUXILIARY : IDI

(a) with the Root—

QEL-idim contracted to *QEL-'dim*. (The *d* and the *i* change according to the Rules of Phonetic Variation.)

[*N. B.*—But it is possible that we ought rather to consider this tense as formed directly in each verb by the addition of a *d* ; as *ir-d-im* itself was formed from the root of *irma* and the Possessive Affix, &c. But if so, we can still trace this form no further back, beyond knowing that the *d* must confer a kind of substantival meaning* to allow of the application of a Possessive affix, by which combination a *Past* sense is acquired (see explanation of *qelghan-im*.) In this case ¹*qel*-²*d*-³*im* would be literally "my ²action of doing (exists)," and thus, "I have done."]

At any rate the form *qel-dim*, &c., is used in the sense of "I did," &c., in relating particular occurrences. It may be called

THE DEFINITE PAST TENSE.

1. *QEL-d-im* "I did"
2. *QEL-d-ing* "thou didst"
3. *QEL-d-i* "he did"
1. *QEL-d-iq* "we did"
2. *QEL-d-ingiz* "ye did"
3. *QEL-d-ilar* "they did"

(b.) with the PARTICIPLE OF CONTINUANCE—

QELâr-idim or *'dim*, or *QELur-idim* = I was continuously doing. This may be used of an *Habitual* action, "I used to do," but more usually it applies only to a particular Past time, and predicates the incompletion of the action at that time. In other words it is our *Imperfect* "I was doing."

By dropping the final *r* and the initial *i*, and hardening the *d* (to avoid confusion with other tenses), the Yârkandis get *qelâttim*, which is the word in vulgar use instead of *qelâr-idim*.

* See Max Müller's "Science of Language," Lecture VIII, p. 346 (Fifth Ed.).

THE IMPERFECT OR HABITUAL TENSE.

1. QELâr-id-im (*qelâttim*) "I was doing" or "used to do"
2. QELâr-id-ing (*qelâtting*) "thou wert doing"
3. QELâr-id-i (*qelâtti*) "he was doing."
1. QELâr-id-ik (*qelâttiq*) "we were doing."
2. QELâr-id-ingiz (*qelâttingiz*) "ye were doing."
3. QELâr-id-ilar (*qelâttilar*) "they were doing."

(c.) with the PERFECT PARTICIPLE—

QELip-id-im, (Yârkand pronunciation *qeliptim*), &c., = I was (in the position of) having completely done; i. e., I had done.

THE PLUPERFECT TENSE.

1. QELip-id-im "I had done."
or-tim
2. QELip-id-ing "thou hadst done."
-ting
3. QELip-id-i "he has done."
-ti
1. QELip-id-ik "we had done."
-tiq
2. QELip-id-ingiz "ye had done."
-tingiz
3. QELip-id-ilar "they had done."
-tilar

This therefore is a *Pluperfect*. It would refer to a special act, while the next Tense would be employed in a more general sense.

E. g. "*I had read* his letter just before he arrived" would be rendered by *oqu'p-idim*; but "*I had read* Túrki before ever I went to Turkistân" would be rendered by *oqu-ghân-idim*.

(d.) with the INDEFINITE PARTICIPLE—

QELghan-id-im, &c., = I was (in the position of) being a past doer, (*viz.* a person who had done). This throws back the *doing* before the time referred to, but that *doing* is itself indefinite. Such a shade of meaning has no exactly corresponding expression in English, but roughly it may also be translated: "I had done," or "I had been doing" and the Tense may be called

THE INDEFINITE PLUPERFECT.

1. QELghan-id-im "I had done."
2. QELghan-id-ing "thou hadst done."
3. QELghan-id-i "he had done."
1. QELghan-id-ik "we had done."
2. QELghan-id-ingiz "ye had done."
3. QELghan-id-ilar "they had done."

(e.) with the POTENTIAL PARTICIPLE—

qelsa-id-im, &c. This would be "the power of doing was mine," i. e., "I might have done" or (with *agar*, "if") "had I dono." This is

THE 1ST PAST POTENTIAL.

1. *qelsa-id-im* "I might have done."
2. *qelsa-id-ing* "thou mightest have done."
3. *qelsa-id-i* "he might have done."
1. *qelsa-id-ik* "we might have done."
2. *qelsa-id-ingiz* "ye might have done."
3. *qelsa-id-ilar* "they might have done."

(f.) with the FUTURE PARTICIPLE OF FITNESS—

qel-ghu-luq id-im, &c. *Qelghu-luq* meaning "fit to do," this tense may be translated: "I was fit to do," or "I was to do." It is

THE PRETERITE FUTURE TENSE.

1. *qelghu-luq-id-im* "I was to do" or "be done."
2. *qelghu-luq-id-ing* "thou wert to do" or "be done."
3. *qelghu-luq-id-i* "he was to do" or "be done."
1. *qelghu-luq-id-ik* "we were to do" or "be done."
2. *qelghu-luq-id-ingiz* "ye were to do" or "be done."
3. *qelghu-luq-id-ilar* "they were to do" or "be done."

Sometimes the auxiliaries *dur* and *idi* are accumulated one on the top of the other: e. g. *qela-dur-idim* (= I was about doing), and *qelip-dur-idim* (= I was in a continuous condition of having done, or, I had been doing).

Before leaving the Auxiliary *idim* we must take notice of the Tenses formed with its derivatory form "*irmish*" or "*imish*," and its Indefinite Participle *ikan*, which, when affixed to certain parts of the Verb and conjugated by affixed Pronouns, reduces their statements to mere probabilities, or makes them conditional.

VI. To express probability, or facts not positively known to the speaker (English "It is understood or believed that," &c.), there is a whole series of tenses in '*mish*.'

The AUXILIARY (IMISH) makes

(a.) with the PRESENT PARTICIPLE—

THE HEARSAY PRESENT TENSE.

1. *qela-imish-inan* "I am understood to do."
2. *qela-imish-san* "thou art understood to do."
3. *qela-imish* "he is understood to do."
1. *qela-imish-miz* "we are understood to do."
2. *qela-imish-siz* "ye are understood to do."
3. *qela-imish-lar* "they are understood to do."

(b.) with the CONTINUATIVE PARTICIPLE—

THE HEARSAY FUTURE-PRESENT TENSE.

1. qelâr-imish-man "I am understood to be about doing."
2. qelâr-imish-san "thou art understood to be about doing."
3. qelâr-imish "he is understood to be about doing," &c.

(c.) with the PERFECT PARTICIPLE—

THE HEARSAY PERFECT TENSE.

1. qelîp-imish (or' mish) -man "I am understood to have done."
2. qelîp-imish-san "thou art understood to have done."
3. qelîp-imish "he is understood to have done," &c.

(d.) with the INDEFINITE PARTICIPLE—

THE HEARSAY PAST TENSE.

1. qelghan-imish-man "I am understood to have done (at some time or other)."
2. qelghan-imish san "thou art understood to have done."
3. qelghan-imish "he is understood to have done," &c.

VII. The auxiliary *dur* has a similar form ;

THE AUXILIARY (DURMISH) makes

(a.) with the PRESENT PARTICIPLE—

THE HEARSAY COMPOUND PRESENT TENSE.

1. qelâ-durmish-man* "I am understood to be doing (continuously understood to do)."
2. qelâ-durmish-san "thou art understood to be doing."
3. qelâ-durmish "he is understood to be doing" &c.

(b.) with the PERFECT PARTICIPLE—

THE HEARSAY COMPOUND PERFECT TENSE.

1. qelîp-durmish-man "I am (continuously) understood to have done."
2. qelîp-durmish-san "thou art understood to have done."
3. qelîp-durmish "he is understood to have done" &c.

It must be understood that although the first person of these tenses is given for the form's sake, yet it is of rare occurrence, the 2nd and 3rd persons being more often used ; for a man is generally not in much uncertainty about facts connected with himself, and does not depend on hearsay for information regarding them.

VIII. We next have the Auxiliary Indefinite Participle *ikan* or *ikin*.

* Example from the "Tazkiratu'l-Bughra": But-khâna-ni ita-durmish—"He is building an idol-temple [I believe,]" or "He is understood to be building....".

AUXILIARY INDEFINITE PARTICIPLE "IKAN" makes

(a.) with the FUTURE-PRESENT—

QELâr-ikan-man. This is used in asking a question, or in making a statement qualified by "if" or "when".

[N. B.—This Tense and the 3 following are as it were, supererogatory, for the "*ikan*" might be omitted without making much difference in the sense. There is just the difference between the English: "What may you be doing?" and "What are you doing?"]

The above may therefore be translated: "I may be doing *or* about doing," and the tense may be called

THE FUTURE PRESENT INDEFINITE TENSE.

1. QELâr-ikan-man "I may be about doing."
2. QELâr-ikan-san "thou mayest be about doing."
3. QELâr-ikan "he may be about doing" &c.

(b.) with the PERFECT—

QELîp-ikan-man, &c. Here the introduction of the Participle *ikan*, reduces the positive affirmation of the Perfect into a mere presumption or rumour. The above compound word may be translated: "I may *or* must have done" or "completed doing." We may call it

THE PRESUMPTIVE PERFECT TENSE.

1. QELîp-ikan-man "I may *or* must have done."
2. QELîp-ikan-san "thou mayest *or* must have done."
3. QELîp-ikan "he may *or* must have done" &c.

(c.) with the INDEFINITE PARTICIPLE—

QELgha-ikan-man, &c. This is similar to the last with the difference of the indefiniteness inherent in the Participle *qelghan*. The meaning is "I may *or* must (at some time or other) have done," and we may call it

THE PRESUMPTIVE INDEFINITE PAST TENSE.

1. QELgha-ikan-man "I may *or* must have done."
2. QELgha-ikan-san "thou mayest *or* must have done."
3. QELgha-ikan "he may *or* must have done," &c.*

(d.) with the FUTURE PARTICIPLE OF FITNESS—

QELghu-luq-ikan-man, &c. The Participle *qelghu-luq* means, as will be remembered, "fit or proper to do." The verbal expression derived from it takes in the Present the indefinite auxiliary form in *ikan*. It thus means "I am to do," &c.

* Example from the "Tazkiratu-'l-Bughra": Pâdshâh ni-chand bala-lar-ni kaba-da alip-kelghan ikan-lar. "The king [it is said] had brought several children in bags." (Le roi aurait apporté. Fr.—Er soll gebracht haben. Germ.)



THE FUTURE OF NECESSITY.

1. *qelghu-luq-ikan-man* "I am to do" or "ought to do" or "be done."
2. *qelghu-luq-ikan-san* "thou art to do," &c.
3. *qelghu-luq-ikan* "he is to do" &c.

The Auxiliaries in the Potential form give us fresh Tenses. Thus *ir-mak* in the Potential is *ir-sa*, and we may take

IX. THE POTENTIAL AUXILIARY 'IR-SA'

(a.) with the CONTINUATIVE PARTICIPLE—

qelâr-ir-sa'm, &c. [*lit.*] the possibility of continuous doing may be mine.] This would evidently mean "I may be (continuously) doing" or "about doing." But the form *qel-sa'm* is more commonly used.

This Tense may be called

THE FUTURE-PRESENT POTENTIAL.

1. *qelâr-irsa' m* "I might be about doing."
2. *qelâr-irsa'-ng* "thou mightest be about doing."
3. *qelâr-irsa* "he might be about doing" &c.

X. THE POTENTIAL AUXILIARY 'BOL-SA' makes

(a.) with the INDEFINITE PARTICIPLE—

qelghan-bol-sa'm, &c. Literally, "the action of doing may become mine," i. e., "I may have done" [see explanation of *qel-ghan-im bâr*]. This may be called

THE INDEFINITE PAST POTENTIAL.

1. *qelghan-bolsa'-m* "I may have done."
2. *qelghan-bolsa'-ng* "thou mayest have done."
3. *qelghan-bolsa* "he may have done" &c.

(b.) with the FUTURE PARTICIPLE OF PROBABILITY—

qelghu-diğ bol-sa'm, &c. Literally "the probability of future doing may become mine," i. e., "I may be likely to do." This is

THE FUTURE POTENTIAL.

1. *qelghu-diğ-bolsa'-m* "I may be likely to do."
2. *qelghu-diğ-bolsa'-ng* "thou mayest be likely to do."
3. *qelghu-diğ-bolsa* "he may be likely to do" &c.

This completes that part of the Turki Verb Conjugation which is effected simply by the apposition of the 10 co-efficient elements respectively to the several stem-elements. But there is also a set of Tenses formed from the Root by means of some special co-efficients which are not applicable to any of the other stem-elements (the Participles). Some of these Tenses are defective. They are :

(a.) An OPTATIVE for the 3rd Person, which seems to be connected in a certain measure with the Potential form. This is QEL-*sun**=let him do; and in the Plural QEL-*sun-lar* [pronounced in Eastern Turkistán: QEL-*silla*]=let. them do. This latter is used as a polite form of address to an equal or superior [conf. the German 'thuen Sic.']

(b.) There is another OPTATIVE DEFECTIVE TENSE with only the 1st Persons Sing. and Plur in -*ai*, and -*ali* or -*aliq* (*alik*). Together we get:

(b.) 1. QEL-*ai* "I will do" or "let me do."

(a.) 3. QEL-*sun* "let him do."

(b.) 1. QEL-*ali* or QEL-*aliq* "we will do" or "let us do."

(a.) 3. QEL-*sun-lar* (*qelsilla*) "let them do" or "be they (you) pleased to do."

(c.) The tense formed by affixing the syllable "*ghai*" (whose guttural varies Phonetically) to the root of the verb, has a similar meaning but is complete in all its persons:

The Root

with the AFFIX GHAI: QEL-*ghai-man*,†=I will do, or let me do. This may be called

THE OPTATIVE FUTURE.

1. QEL-*ghai-man* "I will do" or "let me do."

2. QEL-*ghai-san* "thou wilt do" &c.

3. QEL-*ghai* "he will do" &c.

1. QEL-*ghai-miz* "we will do" &c.

2. QEL-*ghai-siz* "ye will do" &c.

3. QEL-*ghai-lar* "they will do." &c.

We next have to notice some tenses which could not be brought into the simple Scheme of the Verb, because they are, as it were, quantities raised to the 3rd power, being formed by the application of a co-efficient element to a compound consisting in itself of stem and co-efficient,

They are:

(a.) QEL*sa'm-idi*, &c. This, being formed by the application of

* Perhaps this is a corrupted survival of the old Turkish Possessive Affix of the 3rd person (see at end of "Substantives"). Thus QEL*sun* would stand for *qel-sa'n*, which might be compared with *qelsam* = *qel-sa-m*, and *qelsang* = *qel-sa-ng*. The meaning of *qel-sa'n* would have been "the power-of-doing (is) his," thus "let him do."

† This form, from the meaning attached to it, would seem to be connected with the Future Participle in *ghu*.

the aux. 3rd pers. Past tense, to the several persons of the Pres. Potential of the Verb, means literally: "my power of doing existed." "Thy power ... existed," &c. It is therefore equivalent to the 1st Past Potential, *qelsa-id-im* "I might have done." Its possessive affix *'m* changes for the several persons of the tense, while the aux. *idi* remains in the 3rd pers. throughout, like the *bâr* and the *dur* of the 2nd Indef. Past and of the Intentional Future. It is

THE 2ND PAST POTENTIAL TENSE.

1. *qelsa-'m-idi* "I might have done."
2. *qelsa-'ng-idi* "thou mightest have done."
3. *qelsa-idi* "he might have done."
1. *qelsa-'q-idi* "we might have done."
2. *qelsa-'ngiz-idi* "ye might have done."
3. *qelsa-'lar-idi* "they might have done."

(b). *qel-dim-irsa*, &c. This is the 3rd p. of the aux. potential "*irsa*" added to the several persons of the simple Past. (See Remark, on 2nd Indef. Past.) The literal meaning is "my past doing may exist," i. e., "I may have done." But this form seems to be generally used in the simple sense of *qeldim* = "I did," with the *ir-sa* added to give a very slightly potential sense, as after the word "when." This is

THE 3RD PAST POTENTIAL.

1. *qel-dim-irsa* "I may have done."
2. *qel-ding-irsa* "thou mayest have done."
3. *qel-di-irsa* "he may have done."

(c). *qel-dim-ikan*. Here, in the same way, the 3rd pers. of the aux. indef. "*ikan*" is tacked on to the several persons of the Simple Past of the Verb. The literal meaning is "my past doing indefinitely exists." This has simply the meaning "I did," but is used in asking a question or in making a statement qualified by "if" or "when."

Ex.: *tünü-gön nima ish qel-ding ikan* = "yesterday what mayest thou have done."

This is therefore

THE 3RD INDEFINITE PAST TENSE.

1. *qel-dim-ikan* "I may have done."
2. *qel-ding-ikan* "thou mayest have done."
3. *qel-di-ikan* "he may have done" &c.

(d). *qela-dur-ikan-man*, &c. Here the Indefinite *ikan* is interposed before the pronouns of the Compound Pres. Tense. This Tense has simply the meaning of "I am about doing," but is used in the same way as the last.

Ex.: *nima-ish qela-dur-ikân-san*—"What mayest thou be doing;"

1. QELish-im bār, "I have to do."
2. QELish-ing-bār "thou hast to do."
3. QELish-i-bār "he has to do."
1. QELish-imiz-bār "we have to do."
2. QELish-ingiz-bār "ye have to do."
3. QELish-ilar-bār "they have to do."

[N. B.—As the form—'m-bār means "I have," the parallel is complete with "aimerai" (aimer ai) &c. See Max Müller's Science of Language, Vol. 1, p. 258, Fifth Edition.]

(b.) QEL-màq-chi bol-dum, &c. This is the noun of the Agent (see "Formation of Nouns") derived from the Infinitive by the addition of the affix *chi*, with the Past of the verb *bol-màq* (to become). The literal meaning therefore is: "I have become the doer" or "the one who has to do." As it may be presumed that a person only *becomes* so of his own free will, this expression may be translated: I have agreed to do ;" and in this sense it is commonly used.

1. QELmàq-chi-boldum "I have agreed to do."
2. QELmàq-chi-boldung "thou hast agreed to do."
3. QELmàq-chi-boldi "he has agreed to do."
1. QELmàq-chi-bolduq "we" &c.
2. QELmàq-chi-boldungiz "ye" &c.
3. QELmàq-chi-boldilar "they" &c.

Other expressions formed similarly from other tenses of the verb *bol-màq* may also be used, but they are less common, and will, moreover, suggest themselves.

(c.) QELA-durghan* bol-dum, &c. This compound *qela-durghan* (see below: "Verbal Adjectives") means: "about to do." Hence the present expression is equivalent to: "I have become about to do." There is more action of the will expressed here than in the last [for QEL-màq-chi is only "one who has do," whereas *qela-durghan* means "about to do (actually)"]. Therefore while the previous form is only used in the sense of "*I have agreed to do*," the present expression implies active choice, viz., "*I have determined*" or "formed the resolution to do."

1. QELA-durghan (*qelatqan*) boldum "I have determined to do."
2. QELA-durghan-boldung "thou" &c.
3. QELA-durghan-boldi "he" &c.
1. QELA-durghan bolduq "we" &c.
2. QELA-durghan boldungiz "ye" &c.
3. QELA-durghan boldilar "they" &c.

• * Pronounced in Yárkand "*qelado-ghan*," or "*qelütqan*."

Other tenses of *bol-mâq* are used with this; also *durman* and *idim* : c. g.

(d.) 1. QELA-*durghan* (*qelâtqân*) *id-im* "I was to do."

2. QELA-*durghan-id-ing* "thou wert to do."

3. QELA-*durghan-id-i* "he was to do."

&c.

(e.) 1. QELA-*durghan* (*qelâtqân*) *dur-man* "I am about doing."

2. QELA-*durghan-dur-san* "thou art about doing."

3. QELA-*durghan-dur* "he is about doing."

&c.

(f.) QEIsa-'m *bolur ikan*, &c. (The Possessive affix of the *qelsa* changing for the different persons). This expression is very difficult to put into a representative English form; but it shows how distinctly the Eastern Turki language keeps up the recollection of the origin of its verbal forms, and how little these have sunk into consolidated inflections. For here (after the manner of several previous tenses)* the form *qelsa'm*, so far from being looked upon merely as the 1st Person Singular of the Present Potential, is distinctly a Substantive in the possessed form (of the 1st Person Singular), and it is used as the subject or nominative of another verb (*bolur*) in the 3rd Person. By changing the Possessive affix of the "*qelsa*" we should get fresh compound substantives, each of which would again form the subject of the verb *bolur*. Such a series of expressions as these may perhaps be looked upon as a *Tense* in Turki; but they are simply sentences in a certain form with a nominative governing the possessive pronouns of the several persons successively [as in English one might say: my dog runs, thy dog runs, his dog runs, &c.]*

The literal meaning of the expression, however, (as regards the 1st Person Singular), may be said to be as follows :—

QEIsa	'm	bolur	ikan†
the power of doing	mine	about to become	may be

or, as it is used in the interrogative usually with *qâidâgh* (how), we may render it : " [How] may my choice of action be about to come into play ?" or in other words : [How] shall my doing be ?" i. e., " [How] shall I act" or "should I act ?" And so with the other persons, Singular and Plural; the verb "*bolur-ikan*" remaining all through in the 3rd Person Singular. When used not interrogatively, this expression denotes obligation, as "I should" or "ought to...."

1. QEIsa-'m *bolur ikan* "I ought to" or "should do."

2. QEIsa-'ng *bolur ikan* "thou" &c.

3. QEIsa *bolur ikan* "he" &c.

* See also the 2nd Past Potential and the 3rd ditto, and the 2nd and 3rd Past Indefinite Tenses.

† *Bolur-ikan* is the 3rd Person Singular of the Indefinite Future Present of the verb *bolmâq*.

1. QELsa-'q *bolur ikan* "we" &c.
2. QELsa-'ngiz *bolur ikan* "ye" &c.
3. QELsa-'lar *bolur ikan* "they" &c.

(g.) QELsa-'m *bolur idi*, &c. This is the same expression as the last with a Past sense. It means: "should I have done" or "I ought to have done."

1. QELsa-'m *bolur idi* "I ought to have done."
2. QELsa-'ng *bolur idi* "thou" &c.
3. QELsa *bolur idi* "he" &c.

(h.) QELsa-'m *kirak*, &c. The impersonal *kirak* means "it is necessary." The meaning of this expression is therefore (literally) "my potential doing is necessary," i. e., "it is necessary that I should do," or "I must do."

1. QELsa-'m *kirak* "I must do."
2. QELsa-'ng *kirak* "thou" &c.
3. QELsa *kirak* "he" &c.

(i.) QELigh-*liq-man*, &c. QELigh is a Verbal Substantive (see 'Formation of Substs.') meaning "the condition of doing;" the termination *liq* makes it into an adjective "possessing the condition of doing" or "possessed of the qualification of having or being done." The pronoun affixed makes it into a statement, viz., "I am possessed of the qualification of having or being done." It therefore expresses the attainment of a certain state or condition, and not a mere evanescent action.

1. QELigh-*liq-man* "I am in a done or doing state."
2. QELigh-*liq-san* "thou art" &c.

&c.*

N. B.—It will have been noticed in the case of the Possessive affixes used as tense terminations: 1st, that where these are followed by the verb substantive *bür* or *dur*, the 1st person plural keeps the ordinary possessive affix, 'miz, instead of the verbal one of the same person, 'q or 'k (see first note, p. 268). The 2nd Indef. Past and the Intentional Future are examples of this. 2nd, that when the stem terminates in a vowel, as QEL-*ghu*, the possessive affix of the 3rd person is *si* instead of *i*, according to the Rule (See "Substantives, p. 258.") The Potential is an exception. There the affix of the 3rd pers. is simply omitted.

* To these verbal expressions others might have been added. E. g. The following have been found: "Kâshki kimersa *qelghai irdi*" = "Oh that some-one had been about to do?" also *qelghai ikan* = (oh that he) were about to do" or "were going to do". But in truth the combinations are endless.

VERBAL SUBSTANTIVES.

Under this head will be classed those forms which, although represented by Gerunds, Infinitives, &c., in European languages, yet in Turki are real substantives formed from the verb-root, and are treated as such :

(a.) QELâr or QELur ; the Continuative. This is governed by post-positions just like any other substantive :

Ex. : QELur-da="in doing" or "when about to do" (lit. "in the continuance of doing.")

OQUR-gha mail qelur-san=thou wilt choose to read, (lit. thou wilt make inclination to the reading).

(b.) QELghan ; the Indefinite. This is governed by post-positions, and also by Possessive affixes. When used for the *object*, (*i. e.* passively), it would be rendered in English by a relative clause :

Ex. : BILghan-ing="that which thou knowest," lit. "(thing) known of thee."

When referring to the *action*, it would be rendered in a variety of ways in English, according to the sense :

Ex. : QELghan uchun="because of doing" or "of having done."

BOLghan-din-kin="after having become"; lit. "after the becoming."

BOLghân-sari="in the measure of becoming" or "as fast as it becomes."

U"lghân-imiz beh-râq dur="it is better for us to die;" lit. "our having died, or being dead, is better."

In this sense, although a substantive, yet it governs the same case as the simple verb, as do all substantives formed from verbs.

Ex. : yer-ga KIRgan-im="for me to enter the earth," lit. "my entry to the earth."

(c.) QELish* ; the Definite [its vowel is subject to Phonetic change.] This only expresses the action, and never the object. It takes post-positions and Possessive affixes, and governs the same cases as the parent verb :

Ex. : OQUR-sh-um-din=(lit.) "from my reading".

Siz-lar-ni CHIRLâ-sh-du="in calling you," lit. "in the calling (of) you."

Wâjûdi-gha QELish-ing = "thy coming into existence."

Siz-ni ish QELDurush-gha tâqat-im yoq = "I have (there is of me) no power to make you work," lit. "to the making."

(d.) QELmâq ; the so-called Infinitive also is a substantive taking

* This form is perhaps connected with ish "work" or "deed" or "act." Thus qel-ish (? for qel-mâq-ning ish-i) "the act of doing."

post-positions and Possessive affixes ; but always with a Present or Paulo-post-Future sense. Its negative QEL^{mas} also takes affixes.

Ex. : QEL^{maq-uchun}="in order to do ;" lit. "because of the (P. p. F.) doing."

Saning dín-gha KIR^{mak-ing-ni} KH'ah^{lai-dur-man}="I wish thee to enter the Faith ;" lit. "thy entry (acc.) into the Faith I desire."

(e.) QEL^{ghu-luq}. The Participle of Fitness may be used as a substantive with post-positions and Possessive affixes.

Ex. : *siz-lar har-nima de-sa-'nglar de-'nglar, man* QEL^{ghu-luq-um-ni} qel^{úr-man}="say what you may say, I shall do what I have to do (acc)."

Here QEL^{ghu-luq-um} is "what I have to do," i. e. "what is proper for me to do."

(f) QEL^{igh}. This is more a Derivative than a verbal substantive [see "Formation of Substantives"]; but it requires to find a place here on account of the adjective obtained from it.* It has always a concrete sense.

Ex. : *ülchak*="scales" from *ülcha-mak*="to weigh.

ülük="a corpse" from *ül-mak*="to die."

VERBAL ADJECTIVES AND ADVERBS.

Under this head also are included forms which are not represented in the same way in European languages, but exhibit their real structure very plainly in Turki. They are of course undeclined, as is the Turki rule for adjectives.

(a). QEL^{ghali}; from QEL, the root, and an affix *ghali* which may probably be broken up into *ghu* the Future-Participle affix, (or ? *gha* the Dative Post-position), and *li†* for *liq*, adjectival affix. Thus QEL^{gha-li} would be, literally, 'qualified to or for (future) doing,' or "in the manner for doing." In common use it means "for" or "in order,‡ to do."

Ex. : *Körgali kel-üi*="he came in order to see ;" lit. "he came qualified to see."

Bor^{ghali} una-ma-di = "he consented not to become" or "in such a manner as to become."

* In some verbs this form gives a verbal adjective, from which a verbal substantive is formed by adding *lik*, reversing the usual course.

† See Vambéry's "Uigurische Sprach-monumente," p. 39.

‡ With this English expression in fact it corresponds pretty fairly ; "in order" is really only a compound adjective, "arranged" "orderly": e. g. "his affairs are in order"; or a compound adverb: e. g. "arrange yourselves in order." Here the adverb may be still further compounded by adding the purpose : "arrange yourselves in order for marching (in marching order)" or "in order to march." Or again "go singly in order for passing through the gate" or "in order to pass through the gate." Thus the English expression "in order to—" (with an infinitive) is merely a compound adverb, like the Turki form in *ghali*.

Bānghali buyur-dum = "I commanded (him) to go"; viz. "I commanded (him) in order that he should go" or "so that he should go."

(b). *QELip*. The Perfect Participle. This when used in subordinate sentences may be considered as a verbal-adjective qualifying the subject of the chief sentence.

Ex. : *bu káfir-ni üqu-si-din UIGHAT-ip (man) imán-gha targháb qel-ai* = "(I) *having awakened* this infidel from his sleep, should persuade him towards the Faith."

Here "having awakened," &c., is obviously the qualification of "I," which is the subject of the main verb "should persuade."

This is the chief form in which a verb enters into composition with another verb. See "Compound Verbs."

This Participle is also used in a Passive sense : e. g. *sinip ketti*, lit. "it has gone broken" (*tút gayá*, H.) But *sinip birdi* "he broke (it)" (*tor diyá*, H.). Again,

Dozakh DEP *yer*—"the place *called* Hell."

This passive use is less common.

(c). *QEL-ghach*, the Preterite. A similar account may be given of this (see above, first para. of (b.) *Qelip*). The meaning is : "after having done."

(d). *QELA-QELA*. The Reduplicated Present Participle. This denotes "continued doing" or "repeated doing."

Ex. : *Sultán shikár QELA-QELA Artúsh-ga yetti*="The Sultán, *hunting as he went*, arrived at Artúsh."

QELmaï, the Negative Present="not doing" i. e., "without doing."

(e). *QELghàn*. This indefinite (Past or Present) form does duty also as an adjective; and here again it may apply either to the agent or the object (direct or indirect). Of course as an adjective it is indeclinable :

Ex. : *ISHITkan söz*=the speech heard (*pass.*).

ALGHàn kishi=the person taking, *or*, who has taken (*act.*).

It may be itself joined to a noun or pronoun, which may be either its subject or object.

Ex. : *man-QELghan ish*=the work that I do (lit. the me-done work).

shahíd-BOLGHàn yer-da=in the place where (so and so) became a martyr (lit. in the martyr-becoming place).

(f). *QELA-durghan*. The adjective of Paulo-post Futurity; (see remarks, p. 276).

Ex. : *erti KETA-durghan Hajji*=the pilgrim who is going to start to-morrow (lit. the to-morrow-about-to-start pilgrim).

but-khànu ITA-durghan yer-da=in the place where the idol-temple was (or is) to be built (lit. in the temple-about-to-build (*be-built*) place).

It will be seen that this, like all the forms of the Indefinite in *ghan*,

is applicable to either subject or object (direct or indirect).—*i. e.*, is used either actively or passively.

Negative : QELmäi-durghan.

(g). QELghu-luq,—with a Future Passive meaning :

Ex. : QELghu-luq ish=a work *that has to be done*.

(h). QELghu-diğ is active and applies to the agent or subject :

Ex. : şuäbi-ni TAPqu-diğ ish=a work *likely to obtain merit*.

(i) QELigh-liğ, conveying the sense of a condition or state [see 'Verbal Expressions'] ;

Ex. : PÜSÜük-lüq äsh*=food *ready cooked*.

qauhar-birla aräish QELigh-liğ=ornamented with jewels.

THE NEGATIVE.

The Negative of Verbs is formed by the syllables 'ma' 'mäi' or 'mas.' 'Ma' is used in the Tenses of the Root, and in the Perfect, Indefinite, Potential and Future Participles, and the Optative ; it precedes all the conjugational affixes.†

Ex. : QEL-ma or QEL-ma-'ng‡="do not ;" QEL-ma-dim "I did not."

(Perf. Parf.) QEL-ma'p‡ üli, "he had not done."

(Indef. Part.) QEL-ma-ghan-miz, "we have not done."

(Pot. Part.) QEL-ma-sa'm, "I may not do."

(Fut. Part.) QEL-ma-ghu-diğ, "not likely to do," &c.

(Optative) QEL-ma'i "let me not do."

'Mäi' is used for the Present Participle and its Tenses ; or rather, the negative root *qelma* (see last rule) being formed, it comes under the rule (p. 28) by which "where the root ends in a vowel the Present Participle adds an *i*."

Ex. : QEL-mäi-man "I do not" ; QEL-mäi-durman, "I am not about doing."

'Mas' is used for the Continuative Participle in *ur* or *ar*.

Ex. : QELär-man, "I am about doing."

QELmas-man, "I am not about doing."

Also for the Infinitive : QELmas="not to do."

The Defective Auxiliary "*irmağ*" has a negative "*irmas*" or "*imas*" which does duty instead of "*dur*" when a negative sense is required. [There is thus a negative Future-Present Tense of *irmağ*, but no affirmative in common use.§]

* It will be observed that *püş-ük* is the same form as *qel-igh*, the *igh* being changed into *ük* by double phonetic change, *viz.* of vowel and of consonant.

† That is, it comes immediately after the Root, or after the compound formed of Root plus the modifying Affixes in the Secondary Forms of a Verb (which see, *post*).

‡ The Affixes beginning with vowels lose their own vowels after that of the negative syllable, which prevails. (See "Rules of Phonetic Change of Vowels").

§ *Irur* is antiquated.

Ex. : *kichik dur-man*, "I am small."

kichik imäs-man, "I am not small."

This form *imäs* is also sometimes used in compound Tenses, instead of the inserted syllable, to make a negative.

The defective verb *irmek* seems to have no negative form for the past tense ; but the negative Future-Present *imas* is used, prefixed to the (affirmative) Past Tense of the same verb.

Ex. : *QELghan imas idilar* for *QEL-ma-ghan idilar*. "They had not been doing."

Tdakhir QELghu-luk imas, (for *QEL-ma-ghu-luq dur*) "delay is not to be made."

The impersonal verb *bâr* or *bâr-dur*, "there is", "it is," has its negative *yog* or *yog-dur*.

THE INTERROGATIVE

is expressed by adding *mu* (vulg. *ma*) after the verb. This syllable generally follows the last of the affixes of the verb ; but in the Tenses of the Present and Future-Present Participle, the interrogative is often used in the middle of the word, in the shape of a mere letter *m* added to the Present Participle.

Ex. : *QELding mu* "didst thou do ?" [regular form].

QELA-m'-san, "dost thou do ?" [Present-Part. form].

QELmaï-m'-san "dost thou not do ?" [do].

The particle *mu* repeated, stands for English "whether or"

E. g. *ma'lûm bol-maï-dur küfir-mu Musulmân-mu* = "It is not known whether unbelievers or Musulmans."

With the common form *ikan* or *ikin* (Indef. Part., or 3rd pers. of Indef. Past Tense, of *irmek* "to be") the interrogative syllable is prefixed instead of being suffixed, thus *m'ikin* = "is (it) ?" "may (it) be ?" This compound is used, instead of the final interrogative *mu*, wherever *ikan* would be used in the positive. It expresses more of hesitancy between two opinions than the simple *mu*, owing to the peculiar indefiniteness of *ikan* :

Ex. *bu maning-ki m'IKIN* = "may this be mine ?" (*bu maning-ki bâr mu*—would be simply "is this mine ?"). *Ul kishi kela-dur m'IKIN.** = "will that person come (or will he not, I wonder) ?" *Ul kishi kela-m' dur* would be simply "will that person come ?"

See also "Syntax" §§ 10 and 16 for other examples.

* This however may be said to be merely the Interrogative form of the Comp. Fut. Pres. Indef. Tense. Thus *Kela-dur-ikan* = "he may be about coming" ; *Kela-dur-m'ikan* (like *Qela-m'-san* in form) = "may he be about to come" ? The effect is the same however.

THE COMPOUND PASSIVE.

The addition of the Auxiliary verb *bolmâq*, "to become," to the Past Participle of the Transitive verb, forms a Passive, which may be conjugated through all the tenses of the verb "*bolmâq*."

Ex. : *oqu'p-bolmâq*, "to be read."

oqu'p-bolghan, "read." (Indef. Past Participle.)

oqu'p-bolâr, "it is about being read."

&c.

&c.

For the *Simple Passive* see the Chapter on "Secondary Forms of the Verb."

We may now say a few words about the Impersonal Auxiliary above-mentioned—"bâr". This must be carefully distinguished from the verb *bâr-mâq*, "to go," which enjoys a complete conjugation.

Bâr, (pronounced in Yarkand, *bâ*) the Impersonal Auxiliary, means "there is."* It is also used to connect the predicate with its subject affirmatively, or rather to affirm the existence of the subject as connected with that particular predicate, in the same way that *yoq* denies its existence in that connection.

In that sense it sometimes has the pronouns of the 1st and 2nd Persons affixed to it. It is also sometimes prefixed to the Auxiliaries *durman*, *idim*, and *ikan*, and conjugated by their means as follows :—

PRESENT.

1. *BAR-man* † or *BAR-durman*, ‡ "I exist" or "I am."
2. *BAR-san* or *BAR-dursan*, "thou existest," &c.
3. *BAR* or *BAR-dur* "he exists," &c.
1. *BAR-miz* or *BAR-durmiz*, "we exist," &c.
2. *BAR-siz* or *BAR-dursiz*, "ye exist," &c.
3. *BAR* or *BAR-durlar*, "they exist," &c.

INDEFINITE-PAST.

1. *BAR-ikan-man*, "I am" or *BAR-id-im*, "I was."
"may be."
2. *BAR-ikan-san*, "thou art," &c. *BAR-id-ing*, "thou wert."
3. *BAR-ikan* "he is," &c. *BAR-id-i*, "he was."
1. *BAR-ikan-miz* "we are," &c. *BAR-id-ik*, "we were."
2. *BAR-ikan-siz*, "ye are," &c. *BAR-id-ingiz*, "ye were."
3. *BAR-ikan-lar*, "they are," &c. *BAR-id-ilar*, "they were."

* Primarily it means "existence," but used verbally in the Turki manner it means "there is."

† The present of *BAR-mâq*, "to go," would be *BARA-man*, &c.

‡ The tense in *dur* is used, when the fact is merely presumed, to mean "there must be," "there probably is" (II. *howega*). See remarks, p. 276.

In the Negative, the word *yog* would simply take the place of the word *bâr* throughout.

The Auxiliary *bâr* is made to supply the place of the verb "to have" which does not exist in Turki, (see Syntax, § 13). It may be used also as a verbal adjective or noun: *e. g.*, *ahl-im bâr üi-da* = in the house where my wife is (lit. "my wife-being house in);" *bâr-i-ni tuttilar* = "they took what there was of his" [lit. "the existent (things) of him"].

The Indefinite verb-tense *ikan* is the most usual copula in ordinary sentences.

Ex. *Bu ât chung ikan* = "this horse is big."

Finally any adjective or substantive or pronoun can be prefixed to the Personal Pronouns without any copula*: *e. g.*, *ussâk man*, "I (am) thirsty;" *kichik san*, "thou (art) small;" *üi-da miz†*, we (are) at home;" *Tâjik-lar-din siz mu*, " (are) you of the Tâjik tribe?" *yog, biz Turk-lar-din miz*, "no, we (are) of the Turks" (*i. e.*, of Turkish race). The verb substantive is simply *sous-entendu*, or perhaps its necessity is not felt in a primitive language, as neither is it in the language of children, *e. g.*, "me good", "you horse", "me coachman".

CHAPTER VI.

SECONDARY FORMS OF THE VERB.

The Secondary Forms are produced by certain Affixes added to the Root, conveying some modification of the Primary verb.

These Affixes may be super-imposed one on the other as required.

The new Verb thus formed is conjugated just as the Primary Verb, taking the compound of Root plus modifying Affix or Affixes, as a new Root.

I.—CAUSATIVES.

The Turki Causative form gives to a Transitive Verb a Causative sense, while an Intransitive one becomes Transitive. This will be obvious from an example or two:

(a). The first form of the Causative is that which applies to Verbs

* A similar practice in Osmanli Turkish (where the abbreviated forms of the pronouns adopted as tense-terminations, are thus used) has misled Grammarians into the belief that the said abbreviated terminational pronouns form a tense of the Verb Substantive. See p. 246 (text and first note).

† Note that it is the *verbal* or terminational form of the Personal Pronouns that is thus used (*miz* not *biz*), as in Osmanli.

ending with a vowel, or diphthong (or sometimes to those with the liquids *r* and *l*) by affixing a *t*.*

Ex: *Ishla-mak* = to work.

Ishla-t-mak = to cause to work.

Tuga-mak = to come to an end, *i. e.* to finish (intrans.).

Tuga-t-mak = to cause to come to an end, *i. e.* to finish (trans.).

Ibâr-mak = to send: *ibâr-t-mak* = to cause to send.

(b). The second form of Causative is that which affixes *ur*,† *tur* or *dur*,‡ or *shur* (in which the Vowel is constant).

Ex.: *pûsh-mak* = to be in a cooked state [neuter, not passive].

pûsh-ür-mak = to cause to be in a cooked state, *i. e.*, to cook. (Trans.)

kel-mak = to come. (Intrans.)

kel-tur-mak = to cause to come, *i. e.*, to bring. (Trans.)

bil-mak = to know; *bil-dur-mak* = to cause to know, *i. e.*, to inform.

tâp-mâq = to receive; *tâp-shur-mâq* = to cause to receive, *i. e.*, to entrust to.

[N. B.—In the cases of *tuga-mak*, *pûsh-mak*, &c., the English language treats the Turki Causative (*pûsh-ür-mak*, “to cook,” &c.) as the Primary Verb, and the Turki Primary (*pûsh-mak*, “to be cooked,”) &c. as the passive of the same. For we should consider the idea (“to cook,”) to come before the idea “to be in a cooked state.” But the Turki language takes the latter as its primary idea, putting it in the form of a primary (Turki) verb; while it obtains the sense of our simple Active verb by adopting the form of the Causative from what is, in our mouths, a Passive (to cause to be cooked = to cook). This train of thought may sometimes help to account for what may seem to be a non-conformity between the Turki verbal form and its English expression.]

(c). The third form affixes *kur* or *kuz*, the *k* and its vowel changing sometimes according to the Phonetic Rules.

Ex.: *yet-mâq* = to reach.

yet-qur-mâq or *yet-quz-mâq* = to cause to reach.

qel-mâq = to do; *qel-ghuz-mâq* = to cause to do.

kir-mak = to enter; *kir-giz-mak* = to cause to enter.

* Probably a vestige of the verb *it-mak* “to make.” Thus *ishla-t-mak* quasi *ishla-it-mak* “to make to work.”

† Such Verbs as have their Causative in *ur* always have their Continuative Participle in *ür* not *ur* to avoid confusion. Ex. *ichmâq* “to drink;” Continuative Participle *ichür*; Causative form *ich-ur-mâq*.

‡ According to the Rules of Phonetic Variation for Consonants (the vowel does not change).

II.—THE PASSIVE.

(a). The first form of the Passive is obtained by affixing 'l, *il* or *ul* (according to the Phonetic Rules, which see) to the Root. If the Root ends in a vowel, that of the Passive Affix disappears.

Ex. : *àch-màq* "to open;" *àch-il-màq* "to be opened."

tari-mak "to sow;" *tari-'l-mak* "to be sown."

oqu-màq "to read;" *oqu-'l-màq* "to be read."

tut-mak "to seize;" *tut-ul-mak* "to be seized."

N. B.—It seems probable that the origin of this formation was the addition of the Auxiliary *bol-màq*, "to become," to the Perfect Participle of another verb. The combination still survives with a passive signification, as *tutup-bol-màq*, "to be seized" [See "Verbs, Compound Passive."] This might easily be corrupted to *tutubul-màq** by the elision of *p* before *b* and Phonetic change in the Vowel; and thence the step would not be far to *tutul-màq*,* slurring over the *b* between two vowels.

(b). In cases where the Root of the Verb ends in *l*, the Affix of the Passive is changed into 'n, *in* or *un* to avoid the clashing of two *ls*.

Ex.: *bil-mak* = to know; *bil-in-mak* = to be known (not *bil-il-mak*).

[N. B.—Sometimes a Passive is formed from an Intransitive Primary Verb in the regular form, but its meaning is taken from the Causative.

E. g., *ajra-mak* (intransitive) "to be in a divided state." Passive *ajra-'l-mak*, "to be divided." This is, in point of meaning, the Passive of *ajra-'t-mak*, "to divide" or "to cause to be in a divided state" (Caus.); but in form it is the Passive of the intransitive Primary Verb *ajra-mak* which of course by rights could have no Passive].

III.—THE REFLECTIVE.

This is formed precisely as the last [Passive (b)], but can be applied not only to Verbs whose root ends in *l*, but to all whose sense will bear it. Its meaning is directly or indirectly Reflective; but this sometimes gives rise to special meanings, whose exact connection cannot at first sight be traced.

Ex. : *ur-màq* = to strike; *ur-un-màq* = to strike one's self against;
(sp.) to brush against

tolgha-màq = to twist; *tolgha-'n-màq* = to twist one's self,
(sp.) to writhe.

oqu-màq = to read; *oqu-'n-màq* = to read to one's self.

* As least one such instance is actually known where *alip bār-màq* is contracted into *apār-màq*. It must first have been shortened to *alipār-màq* and thence (slurring over the *l* between two vowels) to *apār-màq* which is now in use.

châq-mâq = to strike a light ; *châq-in-mâq* = to strike a light of itself ; (sp.) to lighten (used of the Lightning).

aya-mak = to withdraw (trans.) ; *aya-'n-mak* = to shrink (withdraw one's self).

[*N. B.*—There are some Primary Verbs in the Reflective form, or at least of which no Primary form exists ; this having probably become superfluous in point of meaning, as for example, with *tuga-mak*, "to come to an end," and *tuga-'n-mak*, "to finish itself;" one of these is obviously superfluous, and might be dropped. Even when the real Primary form has become obsolete, the Secondary Verbs are formed as if from it, and not from the Reflective form.

Ex. : *örga-'n-mak* = to learn, (to put into one's own mind). as if from *örga-*
makes *örga-'t-mak* = to cause to learn, or to teach *mak* (obsolete) =
(others), (to put into another's mind). (to have in mind).
and not *örga-'n-dur-mak*.]

IV.—THE VERB OF RECIPROCITY OR COMPANIONSHIP.

This form affixes '*sh*, *ish* or *ush** (according to the Phonetic Rule) to the Verb (root or compound). The sense conveyed is that the action is reciprocal between several persons, if the Primary Verb will bear this sense ; otherwise it means that the action is performed by several together. Like some of the other secondary forms, this sometimes assumes a special restricted sense, which in English is expressed by a separate word.

Ex. : *üs-mak* "to butt;" *üs-üş-mak* "to butt at one-another ;"
tut-mâq "to seize;" *tut-ush-mâq* "to seize one-another", (speci-
ally) "to wrestle ;"
oqu-mâq "to read;" *oqu-'sh-mâq* "to read in company."
ur-un-mâq "to brush against." *ur-un-ush-mâq* "to brush against
one another."

V.—THE VERB OF POSSIBILITY.†

To express the *power* to do or suffer, the Turki language employs no separate Verb (as "I can.....") but adds an affix *âl* to the Verb. This affix remains intact, never changing phonetically as others do.

Ex. : *bâr-mâq*, "to go;" *bâr-âl-mâq*, "to be able to go."
âch-mâq, "to open;" *âch-âl-mâq*, "to be able to open." :
tut-mâq, "to seize;" *tut-âl-mâq*, "to be able to seize."
sât-mâq, "to sell;" *sât-âl-mâq*, "to be able to sell."

* Perhaps connected with *ish* "a companion."

† The Osmanli Turkish seems to have no form of Possibility, only that of Impossibility in *ama* or *emo*. This is obviously a relic of the Eastern or primitive affix of Possibility combined with that of Negation : e. g., (Osm.) *yâz-ama-dî* for (East. T.) *yâz-âl-mâ-dî* "he was not able to write."

[*N. B.*—It may be said that this form is simply the apposition of the Verb *âl-màq*, “to take,” to the Primary Verb. This is probably the origin of the formation; in fact it is sometimes found written separately with the Pres. Participle of the principal Verb followed by the tense of the Auxiliary *âl-màq*; e. g. *qela-âlmàs* = “cannot make”; but, in speaking it has got worn down into a mere formal affix instead of an independent Verb.

Thus the form *bâr'-âlmàq*, *tut'-âlmàq*, &c. may be considered a mere corruption or running together of the full compound: *bâra-âlmàq*, *tuta-âlmàq*, &c.]

Where the Present Participle does not end in *a* but in *i* (in consequence of the Root ending in a vowel, see “Verbs, Pres. Participle”, page 28) no elision takes place between the final *i* of the verb, and the initial *a* of the auxy. This helps to distinguish this form from the Passive in these cases :*

Ex. : [Primary Form] *ajra-mak* = to be in a state of division.

[Passive Form] *ajra-'l-mak* = to be divided.

[Form of Possib.] *ajrai-âl-màk* = to be able to be in a state of division.

(Prim.) *ogu-màq* = to read.

(Pass.) *ogu-'l-màq* = to be read.

(Poss.) *oqui-âl-màq* = to be able to read.

Not only one but two or more of these modifying affixes may be used in the same Compound Verb, as will be seen below.

The order in which they should be applied to the Root, when several come together, depends chiefly on the meaning intended to be given. But there seem to be two general rules, viz., that the *negative* affix when used shall come last (before the conjugational ones), while usually the affix of *Possibility* comes next before the negative (if any), or otherwise last of all the modifying syllables.

	1	2	3	4	5	6	7	8
Ex. :	BIR	-il-	ish-	tur-	al-	maï-	dur-	man
	Root	Pass.	Recip.	Caus.	Possy.	Neg.	Auxy.	Pron.
	Modifying Affixes (Secondary Conjugational Forms)							Affixes.

8 7 6 5 4 2 1 3
= I am not able to cause (them), to be given to one-another.

With the exception of these two modifying affixes (viz., those of Possibility and of Negation), the order of the others is dictated by the meaning intended. For instance:

BIR-il-dur-mak is the Causative Form (in *dur*) of a Passive Verb

* In other cases the distinction (between the Passive and Possibility forms) is made by the Phonetic change of vowel in the former as against the retention of the *a* in the latter : e. g. (Pass.) *tâp-il-màq*, (Poss.) *tâp-âl-màq*.

(in *il*) obtained from the Root BIR. It therefore must mean "to cause to be given."

Again, BIR-*dur-ul-mak* is the Passive (in *ul*) of the Causative Form (in *dur*) of the Verb BIR-*mak*. Thus its sense is: "To be caused to give."

[N. B.—With an Intransitive Verb only one of these two forms would be possible. For with KEL-*mak*, "to come," KEL-*tur-un-mak* would be the Passive of the Causative Form, and would mean "to be caused to come," i. e., "to be brought." But the alternative form KEL-*in-tur-mak* would be the Causative of a Passive Verb KEL-*in-mak*, and such a Verb is logically impossible, since KEL-*mak* "to come," can have no Passive (though it is true a Passive form of certain Intransitive Verbs is used impersonally in a special sense; see "Syntax.")]

Thus each of these affixes modifies the combination *preceding* it, while the resulting meaning is again modified by the next succeeding affix. Each, moreover, may recur (in its varying forms) in the same combination.

Ex. : KIR-*giz-il-dur-ul-mak* = "to be caused to be made to enter", i. e. "to be caused to be brought in," where the Causative Affix appears under the forms of *giz* and *dur*, and the Passive under those of *il* and *ul*.

It will be understood that such complex forms are rare. Still, while generally making use of simple ones, the Turkis reserve to themselves the right of employing the longest compounds, and occasionally exercise the right.

[N. B.—It will be seen from this that the Turki Verb is capable of a vast number of different forms. There are, as we have seen, five Secondary Root forms besides the Compound Passive. The number of Permutations these are capable of is of course enormous. Many of these would be impossible logically (though not formally), while many would be mere repetitions in point of meaning.

But leaving out the Affix of Possibility (which generally comes last), it may be safely stated that with each of the five remaining forms taken successively as the first affix, at least five combinations can be made, conveying each a distinguishable meaning, which would be recognised by any educated native of Turkistan.

This would give us 5×5 , viz., 25 compound forms, to each of which could be added the Affix of Possibility, making up 50. But each of these 50 could be used in the negative; so that there are not less than 100 Compound Roots or Bases.

Or the number may be estimated in this way. Prof. Max Müller, by the application in Western Turkish merely of the Causative, Reflective and Reciprocative Affixes, obtains 12 Secondary forms. For the Eastern Turki, if we attach to each of these the Affix of Possibility, we raise the number of forms to 24, each of which can be put in the Negative, making 48.

Now all but the simplest of these are susceptible of a different order in the affixes (giving a difference of meaning, see above). Moreover, affixes may recur in the same combination (see preceding page). If we allow that these methods double the number of basal forms, we shall be well within the mark, and so we may fairly admit the figure 100 given above.

Now there are some 44 *complete* Tenses (or conjugated expressions), and 4 Tenses with only 4 personal forms apiece. Thus we get 280 Tense-persons applicable to each of the 100 Compound Roots or Bases, besides verbal substantives and adjectives. Multiplying the two sums together we see that the number of intelligible forms which a single Turki Primary Transitive Verb-root is capable of giving rise to, is not less than 28,000.

Prof. Max Müller states that "each Verb in Greek, if conjugated through all its voices, tenses, moods, and persons, yields, together with its participles, about 1,300 forms" (Max Müller Lectures on the Science of Language, 5th Ed., Vol., I, p. 305.)

CHAPTER VII.

ADVERBS, POST-POSITIONS, CONJUNCTIONS, NUMERALS.

THE ADVERB.

Many Adjectives are used as Adverbs without alteration.

Of course it would be superfluous to give a long list of Adverbs, which would be found again in the Vocabulary. But there are certain groups of Compounds which call for notice :

(a). First, a large number are formed by means of the Locative Affix *da* = "at" or "in;" also *din* = "from," and *ga* or *ka* = "to:"

qäi-da or *qän-da* = in what (place) ? where ?

un-da = in that (place), there.

u'-yer-da = in that place.

uza-si-da = on the top of it.

tuban-da = at the bottom.

ara-si-din = from the midst of it.

nim'-ish-ka &c. = wherefore ? (lit.) to what work ?

It will be observed that these are merely Pronouns or Substantives in the Locative, Dative, or Ablative cases.

(b). The Affix *dik*, *däq* or *dägh* gives rise to some Adverbs of similitude.

qäi-däq = what like ? how ?

mun-dägh = like this, thus.

shun-dägh = like that, so.

&c.

Other Compound Adverbs can be formed in the same way by means of the Affix *dâq* or *dik* with various Substantives or Pronouns.

(c). Another set is formed by affixing *cha*, which implies "extent" or "amount."

qân-cha = how much ?

mun-cha = this much.

shun-cha = that much.

ni-cha = how much ?

(d). Sometimes this Affix *cha* is preceded by the Dative Post-position :

an-ga-cha = "to that extent" or "so far as that".

kachan-ga-cha = "to what extent of time ?" *i. e.*, "till when ?"

Thus the Compound Affix *gha-cha* comes to mean, in point of place "so far as," and in point of time "until." It answers to the Compound Verbal Affix *ghun-cha*. This is written in Kâshghar *ghu-cha*, which would derive it from the Future Participle is *ghu*; or it may be the termination of the Indefinite Past Participle "*ghan*" with the same affix "*cha*," and thus QEL-*ghun-cha* would be literally "to the extent of the (indefinite) doing," which sense agrees well enough with the common use of this form *viz.*, "whilst doing" or "than doing."

Neg. QEL-*ma-ghun-cha*, = "whilst not doing," *i. e.* "until (he or it &c.) does."

Ex. : *mulaqât BOL-ma-ghun-cha* = until a visit was paid, (lit. "whilst not paid").

Saning dîn-ing-gha KIN-ghun-cha = than entering into thy Faith.

(e). The Substantive *yân* "side" forms several Adverbs :

qâi-yân-gha = to which side ?

qâi-yân-du = in what direction ?

u-yân-din or *u-yân-i-din* = from that direction.

bu-yân-du or *bu-yân-i-du* = in this direction.

(f). Next comes a group of which the derivation is less plain, but the connection in sense and form evident.

biri = on this side.

nari = on that side.

ichkari = inside [*ichra* = *ditto* (also found)].

tâshqari = outside.

ilgari = before.

yogari = above.

utra or *utru* = opposite, facing.

N. B.—It will be observed that the sense of all these is *locative* while the terminations are two : the simple *ari* or *iri*, and the fuller *kari* or *gari*. It is probable from analogy that some word indicating "place" or "locality" must be the origin of these endings. That word must be found in the

simpler as well as in the fuller forms. Hence it may be inferred that the *k* (*q* or *g*) of some of them is not a part of the word we are seeking. Looking then simply at *ari* or *iri*, where we are to find the meaning "locality," we are reminded at once of *yer-i* = "its place." I venture to suggest, therefore, that *biri* may be a corruption of *bu-yeri* (= this place), and *nari* of *an-yeri* or *'n-yeri* (= that place).

As for the others, *ichkari*, &c., it will be observed that *ich* is a Substantive (see Vocabulary) meaning "the interior." *Tùsh* or *tish* means "the outside." Again it may be gathered by comparing the Chaghatai word *ilaï* "before" with the Uigur word *ilik* (? *il-lik*) "first," that there must once have been a word *il* meaning "front," which would be the origin of *il-gari*. Lastly, as there is an Uigur Verb *yoq-la-maq* = "to be elevated," it may be gathered that *yoq* as a root conveys the idea of height, whence *yogari*.

It will be observed that such of these compounds as take the simpler form without *k*, begin with Pronouns, while those which take a *k*, &c., before the element *ari* begin with Substantives. Now an Adjectival Pronoun can be prefixed to a Substantive without intermediation. But a Substantive cannot be so attached to another Substantive. The regular formation in such a case is to affix the particle *gi* or *ki* [see p. 279 (b)] to the former, making it into an Adjective of Relation. Now this is exactly what we find in these words. Wherever the first element is a Substantive, we find a *k* introduced between the two parts of the word. This confirms my supposition that the final element is a Substantive. If we wished to combine the Substantive *ich* "interior" with the Substantive *yer* or *yeri* "place" according to rule—we should say *ich-ki-yeri* = "the inward place", "the inside" (*ich-ki* being an Adjective of Relation meaning "inward") a form easily contracted to *ich-k'ari*. And so, *tùsh-q'ari* for *tùsh-qi-yeri* "the outside;" *il-g'ari* for *il-gi-yeri* "the fore-side;" *yoq'ari* for *yoq-gi-yeri* "the up-side." (*Utra* is probably from a Participle of *ut-mak* "to cross", and not from a Substantive.)

But it may be said that these words (if formed as I have suggested) are mere Compound Substantives, and not Adverbs. This is so true that they are often treated exactly like Substantives. They are not only declined by means of Post-positions (e. g., *ilgari-da*, *tùshqari-gha*, &c.), but they are also frequently put in the "possessed" form, and govern the genitive of the object, e. g. *üi-ning ichkari-si-gha*, "to the inside of the house"; *man-ing ilgari-'m-da*, "at the front of me."

Vámbery thinks that these forms may be divided into a mark of the dative *ga*, and a final syllable *ra* or *re* (indicating a *direction towards* according to Schott)*. I have ventured to offer another solution above, which I

* Quoted by Vámbery, "Chagataische Sprachstudien," p. 20, note.

will further support by remarking that the treatment of these forms as Substantives (see last para.) quite accords with the supposition that they are for-

med on the word “*yer-i*.” Thus ^{1 2 3 4 5 6}*üi-ning ichkari-si-gha* would be—(lit.)
^{6 5 3 4 2 1} “to its inner place of the house,” and ^{1 2 3 4 5 6}*maning ilgari-’m-da* would be (lit.)
^{6 5 3 4 2 1} “at my front place of me.”

But such expressions are hardly consistent with the supposition that *ichkari* is made up of *ich* the “interior” plus *ka* “to” (*Dat.*), plus *ri* (a

Post-position supposed to imply *direction towards*). For ^{1 2 3 4}*üi-ning ich-ka-ri-si-*
^{6 5 4 3 2 1}*gha* would then be (lit.) “to its towards to interior of the house” with 3 Post-positions (two of them identical) agglomerated on the top of one another, and only broken by a Possessive Affix detached from any Noun. And *maning il-ga-ri-’m-da* would be on the same system (lit.) “at my towards to front of me.”

With regard to such forms as *qail-ru* “backwards,” *üz-ra* up &c. (to which may be added *ich-ra* “inside”) quoted by Prof. Vámbéry to prove that the syllable *ra* is separate from the (supposed) Dative termination *ka*, and does not form part with it of a single element *kari* or *gari*, this conclusion is doubtless correct, as moreover the examples *biri* and *nari* show. Prof. Vámbéry and I are agreed in thinking that the *k* element is distinct from the *r* element. What they each represent, is a different question. If the latter meant “direction towards,” the addition of the former with much the same sense, (viz. *ka* = to) would be superfluous; and still more so, on this supposition, would be a second apposition of the same affix in the expression *tàshqari-gha*, &c.

Moreover in the words above quoted of Eastern Turkistani, I cannot trace any signification of “direction towards.” In that dialect they all apply to “rest in a place” (e. g. *Tàshqari* is the name of the outer courtyard of a house, and *ichkari* that of the inner or women’s court), as moreover can be gathered from the fact that to express *motion* the dative post-position is added; e. g. *tàshqari gha* “to the outside,” “outward”; while it is quite correct to say *ichkari ulturadur* “he is sitting inside,” *tàshqari turdi* “he stood outside,”* which would be abnormal if those words implied motion or direction towards. As for the forms *ich-ra*, *üz-ra*, &c. (from the substantives *ich* = interior and *üza* = surface) where we should expect to find the particle *ki* following the initial element, it is probable that in the more Westerly dialects (for they are not common in Eastern Turkistân), the substantive *yeri*, having already been contracted to *ra* or *ri*, has further

* The phrase, “*Bàdshah birla Wazir tàshqari tur-up irdi-lar*” = “The King and Vizier were standing outside,” has been found.

sunk into a mere post-position, so that its substantival origin and the consequent necessity for the relative particle, *ki*, after other substantives attached to it, may have been forgotten."

Thus it is only when governed by Post-positions, as "*da*", "*gha*" or "*din*" (expressed or understood), that such forms can be considered as Adverbs, although these Post-positions are often suppressed as understood.

When themselves governing Nouns or Pronouns, they of course become Compound Post-positions, as in the instances given above in the Note.

(g). Another group is formed with the Affix *lash*, implying "direction" or "inclination towards."

yogari-lash = upwards.

tuban-lash = downwards.

ura-lash = sloping upwards.

ara-lash = mixedly, *i. e.*, middle-wards.

POST-POSITIONS.

These may be divided into two classes, SIMPLE and COMPOUND.

The SIMPLE POST-POSITIONS are mere affixes attached to the words governed by them, and forming what may be called (for the sake of comparison with the inflectional languages) various cases, Dative, Locative, &c.

The Simple Post-positions are: *da* "at" or "in," *din* "from," *gha*, *ga*, *ga* or *ka* "to," *ning* "of," *ni* (sign of accusative absent in English), *birla* or *bilan* "with," *siz* "without," *uchun* "for," "because of," &c., &c.

The COMPOUND POST-POSITIONS are really Substantives, which are themselves affected by the simple Post-positions, *e. g.*, *ICH-i-da* "inside," [lit.] "in its interior," *ÜZA-si-gha* "a'top," (lit.) "to its top." These are sometimes applied directly to a substantive. But they also frequently require other Post-positions to connect them with the words they govern, *e. g.*,—*din KIN* (lit.) "AFTER from ...;"—*ning ÜZA-si-da* "A'TOP of—."

When they are used with the *genitive* of the noun governed, the sense is made definite.

Ex. : *Túgh-ning ÜZA-si-da* = on the top of *the* mountain.

Túgh-ning TUBAN-i-da = at the foot of *the* mountain.

When *din* is used instead of *ning*, or when the two Substantives are merely placed in apposition without any Post-position between, the sense becomes indefinite (especially in the latter case).

Ex. : *Túgh-ÜZA-si-da* = on the mountain-tops.

Túgh-din-TUBAN-da = below the mountains.

The following is a list of the more usual forms ; it being remembered that all can employ *ning* in the definite sense before them, while such as here have *din* prefixed, use that post-position for the indefinite (the others being merely placed in apposition when the sense is indefinite) :—

	<i>ustun-da</i> or <i>gha</i> , &c.	= upon.
	<i>àltin-da</i> „	= under.
	<i>àstin-da</i> „	= <i>ditto</i> .
	<i>ich-i-da</i> „	= inside.
	<i>arà-si-da</i> „	= amidst.
	<i>üzà-si-da</i> „	= a'top of.
	<i>tupà-si-da</i> „	= upon.
	<i>tub-i-da</i> „	= in the bottom of.
	<i>yàn-i-da</i> „	= at the side of.
(only with <i>ning</i>)	<i>qàsh-i-da</i> „	= in the presence of.
ditto	<i>àld-i-da</i> „	= in front of.
ditto	<i>bu-yüz-i-da</i> „	= on this side of.
ditto	<i>u-yüz-i-da</i> „	= on the further side of.
ditto	<i>kín-i-da</i> „	= in the rear of.
ditto	<i>arqà-si-da</i> „	= at the back of.
ditto	<i>tàsh-i-da</i>	= on the outside.
Defte. (<i>ning</i>) ; Indfte. (<i>din</i>)	<i>ichkari</i>	= inside.
ditto	(<i>din</i>) <i>arqà-da</i>	= behind.
ditto	(<i>din</i>) <i>kín</i>	= after.
ditto	(<i>din</i>) <i>tuban</i>	= below, in a lower position than.
ditto	(<i>din</i>) <i>tag-i-da</i>	= beneath, under, (with something superposed).
ditto	(<i>din</i>) <i>ustun</i>	= above, higher than.
ditto	(<i>din</i>) <i>àstin</i>	= below.

All these declinable Substantives admit also of the Possessive Affixes, e. g. *maning qàsh-im-da* = “in my presence”; *saning yàn-ing-din* = “from thy side.”

The Compound *ghacha* (*gha* “to,” *cha* “the extent of ;” see Adverbs) is used as a Post-position meaning “till” or “as far as.”

Ex. : *Tiz-ghacha* = as far as the knee ; *Kàshqar-ghacha* = as far as Kashghar ; *bàsh-tokhi-ghacha* = till first cock, (*i. e.*, till cock-crow).

CONJUNCTIONS.

There are not many Conjunctions in Turki. It borrows them frequently from Persian and Arabic.

The home-born ones are *kim* “that,” *takhi* “still,” “notwithstanding,” *imdi* “then,” &c., and the compound *an-din-kín* “afterwards,” &c.

NUMERALS.

The CARDINAL numbers are :

<i>bir</i> = one.	<i>yigarma</i> = twenty.
<i>iki</i> = two.	<i>ötöz</i> = thirty.
<i>öch</i> = three.	<i>qırq</i> = forty.
<i>tört</i> = four.	<i>illiq</i> = fifty.
<i>besk</i> = five.	<i>altmish</i>
<i>alti</i> = six.	<i>or atmish</i> = sixty.
<i>yette</i> = seven.	<i>yetmish</i> = seventy.
<i>sakiz</i> = eight.	<i>sakzan</i> = eighty.
<i>toqoz</i> = nine.	<i>toqzan</i> = ninety.
<i>un</i> = ten.	<i>yüz</i> = a hundred.
	<i>ming</i> = a thousand

tuman = ten thousand.

The intermediate numbers are formed by simple apposition, the multiples of ten coming first, as : *un-bir* = "eleven," *ötöz-besk* = "thirty-five"; *tört-yüz sakzan-öch* = "four hundred and eighty-three"; *bir ming iki yüz toqzan* = "one thousand two hundred and ninety." It will be seen that to express multiples of a number the smaller factor comes first, as above : *tört-yüz* = "four hundred".

There is a class of *Substantives* derived from the cardinal numbers, which had better be noticed in this place.

bir-ao or *bir-äilan* = one by itself, "a one."

ik'-ao or *ik'-äilan* = a two, a pair, both.

&c., &c.

[*N. B.*—It is probably by a contraction of the former that we get the Post-position *bir-lan*, *birla* or *bilan* = together with, "in one." See *Kudatku Bilik*, *Introd.*—*aning imsâli bir-ailin* "with their proverbs."]

Next we have the Numeral *Adjectives* or ORDINAL Numbers. These are :

<i>bir-inchi</i> = first.	<i>yigarma-'nchi</i> = twentieth.
<i>iki-'nchi</i> = second.	<i>ötöz-unchi</i> = thirtieth.
<i>öch-önchi</i> = third.	<i>qırq-inchi</i> = fortieth.
<i>tört-önchi</i> = fourth.	<i>illiq-inchi</i> = fiftieth.
<i>besk-inchi</i> = fifth.	<i>atmish-inchi</i> = sixtieth.
<i>alti-'nchi</i> = sixth.	<i>yetmish-inchi</i> = seventieth.
<i>yetti-'nchi</i> = seventh.	<i>sakzan-inchi</i> = eightieth.
<i>sakiz-inchi</i> = eighth.	<i>toqzan-inchi</i> = ninetieth.
<i>toqoz-unchi</i> = ninth.	<i>yüz-ünchi</i> = hundredth.
<i>un-unchi</i> = tenth.	<i>ming-inchi</i> = thousandth.

[*N. B.*—The termination is often written and pronounced *ji*. The ordinal affix is only applied to the last term of a compound number as : *bir yüz qirg-sakiz-inchi* = one hundred and forty-eighth.]

There are also some Numeral *Adverbs* formed by the additional of 'n'. As *bir-in iki-n* = by ones and by twos.

N. B.—Perhaps a contraction of *bir-din iki-din*, which form also exists with the same meaning.

Bir-ar, (no *ik-ar*), *öch-ar*, *tört-ar* &c., = "singly," "by threes," "by fours," &c.

"Once," "twice," &c., are formed with *qàtim* "time" as, *iki-qàtim* "twice," *bes-qàtim* "five times," &c.

THE TURKI YEAR-CYCLE

Consists of twelve solar years, each named after some animal in a fixed order, as follows :—

1. <i>Sachkan</i> "The Mouse."	7. <i>At</i> "The Horse."
2. <i>Uï</i> "The Ox."	8. <i>Qoï</i> "The Sheep."
3. <i>Bárs</i> "The Leopard."	9. <i>Maïmun</i> "The Ape."
4. <i>Tushqan</i> "The Hare."	10. <i>Tokhi</i> "The Cock."
5. <i>Balik</i> "The Fish or Dragon."	11. <i>It</i> "The Dog."
6. <i>Ilan</i> "The Serpent."	12. <i>Tunghuz</i> "The Hog."

The present year (1874-75) is the year of the "Dog." The year begins and ends in the spring, and is divided into twelve 'mansions,' in each of which the Sun spends a month (the twelve Signs of the Zodiac). These are known only by their Arabic names at the present day.

The above chronological arrangement of solar years is purely Turkish (or perhaps Tartar in the extended sense). The Muhammadan lunar years and months are in more common use now ; the solar ones being only employed in calculations of age and in matters where it may be a question of the season.

Each entire cycle is called a "*muchal*."

CHAPTER VIII.

DERIVATION OF WORDS.

FORMATION OR DERIVATION OF SUBSTANTIVES.

(a). A noun of the *AGENT* is formed by adding the affix *chi* to the Future Participle or to the Infinitive form of a Verb :

Ex. : *qel-ghu-chi* = a doer.

Bir-mak-chi = a giver.

(b). A Noun of PROFESSION is formed by affixing *chi* to the name of the object used, or of the matter dealt with :

Ex. : *miltek-chi* = a muskoteer.

zakât-chi = a Custom's official.

(c). An ABSTRACT Noun is formed by the addition of *lik* or *luk* (with Phonetic variation both of Vowel and Consonant) to an Adjective or Adverb, or even to another Substantive :

Ex. : *Sarigh-liq* = yellow-ness.

Tola-lik = much-ness.

Ustâd-lik = art (from *ustâd* "artificer," P.).

Gum-râh-lik = perdition (from *gum-râh*, "lost road," P.).

• Also to an Infinitive, or the Verbal Adverb in "*ghuncha*."

ültür-mak-lik = slaughter (from *ültür-mak* "to kill").

ishit-kuncha-lik = worth-hearing-ness.

(d). A Noun of ORIGIN is formed by adding *lik* (or *luk*) to the name of a country or place :

Ex. : *Khogand-liq* = a man of Khokand, a Khokandi.

(e). A Noun of CONNECTION, by adding *chan* to any word to denote continuous or frequent connection :

Ex. : *aghrik-chan* = one who is constantly ill, an invalid.

salla-chan = one who always wears a turban (*salla*).

(f). A Noun of FELLOW-SHIP is made by affixing *dâsh* or *lâsh* (answering to our "—— fellow") :

Ex. : *âtâ-dâsh* = a brother by the same father (*âtâ*).

gursâq-dâsh = a twin (lit. "womb-fellow").

dâsh-dâsh or *tabâq-dâsh* = a meal-fellow, or one who is a companion at a meal.

maktab-dash = school-fellow, (*maktab*, "school," A.).

(g). A VERBAL Substantive is formed by affixing *k*, *q*, *g* or *gh* to the Root, supplying the proper vowel when necessary, before it. The meaning is either the action of the Verb, or the result of that action :

Ex. : *tüz-ük* = an institution (from *tüz-mak*).

TITRA-'k = a trembling (from *titra-mak* "to tremble").

[N. B. → That this Substantive is derived from the Verb, and not *vice versa*, is shown by the fact that the verbal form derived from *tüzük* would be *tüzük-la-mak*, and not *tüz-mak*, &c. (see "Formation of Verbs").]

DERIVATION OF ADJECTIVES.

(a). The Adjective of LIKENESS is formed by affixing *dik* (which is subject to Phonetic variations of the guttural) to a Substantive :

Ex. : *goi-diq* = "sheep-like" (from *goi* "a sheep").

(b). The Adjective of RELATION is formed by the addition of the particle *gi* or *ki* to Substantive, Adjective, Adverb or Participle (see pp. 26 and 77) :

Ex. : *kîn-gi*="following," "last" (from *kîn*=rear) ;
yetkan-gi="arriving," or "which has arrived."

(c). The Adjective of QUALITY is formed by affixing *lik* (or *luk*) (subject to Phonetic variation of guttural) to a Substantive or Participle :

Ex. : *Dada-lik haqq*="a father's right" (fatherly right).

Kâfristân-lik="infidel" (said of a whole country) ; from *Kâfristân*="a land of infidels".

(d). A VERBAL Adjective is formed by adding *k* or *q* to a Verb Root (supplying a vowel before it when necessary).

Ex. : *aghri-q*=ill, from *aghri-maq*=to be ill.

to'q=satisfied, from *toi-maq*=to be content.

tüz-ük=right, in order, (see p. 53 (*f*) and note).

(e). An Adjective of HABIT is formed by adding one of the affixes *kak*, *qâq* or *chak* to the root of a Verb :

Ex. : *öch-qâq*="flying about much ;" from *öch-mâq*="to fly."

qurq-qâq="fearing much ;" from *qurq-mâq*=to fear.

irin-chak="lazy ;" from *irin-mak*="to procrastinate."

(f). An Adjective or Adverb of FASHION or MODE by adding *cha* :

Ex. : *mazlûm-cha chappan*=a woman's robe. *Turk-cha min-mak*=to ride as a Turk.

COMPOUND AND DERIVATIVE VERBS.

(a). The commonest compound is the Perfect Participle of one Verb prefixed to another Verb which completes the meaning, and which is conjugated as may be required.

Ex. : *sât-ip âlmâq*=to buy, or take by purchase, (*sât-ip*=sold, *âlmâq*=to take).

âlip-bârmâq=to take away (*âlip*=having taken ; *bârmâq*=to go), contracted in Yûrkand to *apârmâq*.

yetip-qâlmâq=to exceed, (*yetip*=having reached a limit) ; *qâlmâq*=to remain (over).

küyüp-birmak=to burn, or "give over to burning" (*küyüp*=having burnt, *birmak*=to give).*

It will be remembered that the auxiliary *bolmâq* used in this way with the Perfect Participle of a Transitive Verb makes a Passive, e. g., *gelip-bolmâq*=to be done.

(b). Another formation consists of the Present Participle of one

* *Birmak* "to give", *qoi-mâq* "to put", and some others, are often redundantly used in the second place, like the Hind. *dena*, &c.

Verb before another Verb of different signification, answering to the English combination of a similar kind.

Ex. : *qela-bàshlamàq* = to begin doing, or "to begin to do."

A Verb is formed from a Substantive by affixing *la* to form the Verb-root. Verbs thus formed are numerous :

Ex. : *ish-la-màq* = to work (from *ish* "work").

bàsh-la-màq = to lead or to begin, "to head" (from *bàsh* "head").

A Verb of colour is formed by affixing the syllable '*r*' to the adjective of colour, &c.

Ex. : *àq-ar-màq* = to become white.

Öz-ga-'r-màq = to change colour (from *öz-ga* = other).

CHAPTER X.

S Y N T A X.

The following are points to be noted :—

1. The nominative or subject generally comes first in a sentence, and the verb always last.

Ex. : "HAZRAT SULTAN *shikàr-ga chiqtilar*" = "The Sultan went out to hunt."

When it is desired to put emphasis upon the subject, it comes immediately before the verb.

Ex. : "*Hazrat Sultàn-ga kalima tayiba-ni* KHWAJA KHAZAR *örgat-tilar*."

viz. "It was Khwāja Khazar who taught the 'kalima tayiba' to His Highness the Sultan."

Literally : "To His Highness the Sultan the kalima-tayiba (accusative) Khwāja Khazar taught."

2. The usual order of a simple sentence is :

(a). That the accusative or object shall immediately precede the verb and its adverbs or adverbial expressions, (other cases coming first) :

Ex. : "*Kh'āja Abu-l-Nasr Sāmāni Hazrat Sultàn-ga* IMAN-NI *shul-ger-da örgattilar*."

"Kh'āja Abu-l-Nasr Sāmāni to His Highness the Sultan the faith (acc.) on-the-spot taught."

(b). Sometimes the seeming accusative forms really part of a compound verb, in which case also it immediately precedes it, but without the mark of the accusative.

Ex. : *Bu qirq kishi Hazrat-din* BUKHSAT-àldilar. "These forty persons from His Highness took leave."

The sign of the accusative is also omitted if the sense is indefinite :

Ex. : *nân yemak* = to eat bread.

(c). Sometimes the accusative is put first for emphasis (viz., out of its proper place).

Ex. : "UL DUSHMAN-NI *ara-din yoq-qelmadim*" = "That enemy from (our) midst I have not destroyed."

UL BUTKHANA-NING TAM-I-NI *avival siz qupàrip-biring dedur*,
that idol-temple-of the wall (acc.) first you having raised give, he says
viz. "He says, you first raise the wall of that idol-temple."

3. All subordinate clauses, and all sentences which in English would be joined by conjunctions, in Turki have their respective verbs put in the form of some Verbal Adjective (generally that in 'p), the sense being thus kept flowing on until the whole of the long chain of sentences is concluded by a personal Verb :

E. g. *Kàshqar khalq-i-ni kàfir-lar öz dîn-i-gha kirguz-up, it eshak tunguz gosht-i-ni ye'p, harâm harîsh-ni mubâh bil-ip, mutlaq kàfir bol-up, qàlip ikan.*

"The unbelievers *having caused* the people of Kàshghar to enter into their own religion, they (the Kàshgharis) *having eaten* the flesh of dogs, pigs and asses, *having considered* unclean snakes to be lawful (food), *having become* unrestrained infidels, *have remained* (so) [or, have become and remain unrestrained infidels]."

It will be noticed here that the author has changed his subject or nominative after the first clause. This is merely due to careless writing, as we sometimes see in English [e. g. "Having finished my dinner the dance began."] The last verb *qàl-ip ikan* can only by courtesy be called a *personal Verb*. Often a speaker begins a string of sentences in the above form but finding that he has completed the expression of his meaning, he leaves his speech grammatically incomplete by omitting to add a final personal verb.

4. The Genitive precedes the substantive which governs it :

Ex. : "SULTAN-NING *dada-si*" = "The Sultan's father."

5. The adjective does the same usually, except in Persian or Arabic combinations.

If the adjective for any reason comes last, the Post-positions, &c., are affixed to it, as being the end of the compound substantive (formed of it and its noun) :

Ex. : *kalima-tayiba-ni*.

6. When an adjective is in the Comparative, the object of comparison precedes it.

Ex. : "*Tàsh-din yamân-râq*" = "Than a stone worse."

7. If the sentence predicates a quality of the subject the adjective or words expressing the quality immediately precede the verb :

Ex. : "*Sultàn-ning dada-si kàfir-lik-da tàsh-din ham yamàn-ràq irdi.*"
 Lit. "the Sultàn's father in infidelity than a stone even worse was."

8. Relative clauses in *who* or *which*, are not so expressed in Turki. They are attached to the substantive to which they refer (preceding it), and form a compound adjective or subordinate sentence with its verb in the form of a verbal adjective, generally in *gan* (if Present or Past) or in *durghan* if Future.

(a). Ex. : AT-NI SAT-KAN *kishi* = The person *who* sells the horse.
 Horse (acc.) selling person.

ERTI KETA-DURGHAN *hujji* = The pilgrim *who* is going to start
 To-morrow about-to-go pilgrim.

to-morrow.

If the (English) relative pronoun is in the accusative, dative, &c., still the Turki form is similar to the above (the sign of the accusative &c., being omitted), and the verbal adjective may have its subject or nominative expressed before it (or understood).

Ex. : (In the Accusative) BIZ QEL-GHAN *ish-lar* = The deeds *which*
 we do.

SAN KÖRGAN *kishi* = the person *whom* thou
 sawest (or seest).

(In the Dative) BIZ BASH UR-GHAN *nima* = that *to which* we strike the
 Lit. we head- striking thing.

head (bow).

(In the Genitive) MAN AT-I-NI URGHAN- *adam keldi* = Tho
 I horse his (acc.) having struck man came

man *whose* horse I struck came.

AT-I ÜLGHAN *kishi yighläi-dur* = The person *whose* horse died, weeps.
 horse his having died person weeps.

TÜSH-ÜM-DA KÖRGAN *shër*. Lit. "in-my-dream-seen lion."

Viz., "The lion which I saw in my dream."

"NICHAND YIL-NING BU YÜZI-GHA BİLÄZAT WA MASHAKKAT BILAN
 TAPKAN *farzand-im.*" Lit. "So-many-years-on-this-side-
 of-with-self-denial-and-pain-obtained son-of-mine.

viz., "My son, whom," &c.

Or, conversely, the rule may be stated thus: The Substantive in Turki to which is attached (*i. e.* prefixed) a verbal adjective (indefinite) in *gan*, may be either the *subject* of the action of that verbal adjective, or its *object* (direct or indirect); and the said verbal adjective may accordingly be rendered in English, as the context may indicate, either by "*who or which* (does or did) e. g. *satkan kishi* = the person *who* sells."

Or else by "*whom or which* (so-and-so does or did)"—e. g. *körgan kishi* = the person *whom* (so and so) saw, [which may also be translated "*which was seen* (by so and so)"].

Or else by "to whom *or* to which (so and so does *or* did)—," e. g. *bâsh uryhan nima* = the thing *to which* (so and so) bows the head; &c., &c.

As in the first case the *object* may be expressed with its proper sign before the verbal adjective (e. g. *AT-NI satkan kishi* "the person who sells the horse") thus forming a subordinate clause in the sentence; so also, in the latter cases, the *subject* may be and is generally, prefixed to the verbal adjective for clearness' sake, except when otherwise indicated sufficiently plainly. Thus: *BIZ-qelghan ish* "the deed which *we* do" (or "the deed done by us"); *SAN körgan kishi* "the person whom *thou* sawest" [*SAN-NI körgan kishi* would be "the person who saw thee."]

But in *tüsh-üm-da körgan sher*" the possessive affix *üm* sufficiently indicates that it was I that saw the lion, so that it is unnecessary to add the subject and say "*MAN...körgan...*" On the other hand if the lion were the *seer* we should say: *man-NI körgan sher* "the lion which saw me."

(b). If the subordinate clause merely predicates the existence of its subject in a certain relation, so that it has no verb except "to be," the Turki language omits the verbal adjective or participle of this verb, and supplies its place with the particle '*gi*' or '*ki*' to connect the clause with its subject, which comes last in order.*

Ex. : "*TURKISTÂN-TARAF-I-DA-GI khalq.*" Lit. "Turkistân direction-in-(being) people."

viz. "The people that are in the direction of Turkistân."

(c). To express a simile, the word or the whole subordinate sentence is connected with its subject by the particle '*dik*' = like.

Ex. : "*DOZAKH-NING-DARWÂZA-SI-NI ACHQAN- DIQ aghz.*"

Lit. Hell of door its (acc.) having opened like mouth.

viz., "a mouth as if opening the door of Hell."

Likelihood is similarly expressed :

* This syllable *gi* or *ki* takes the place (in sentences where the subordinate verb is "to be") of the indefinite Participle or verbal adjective of that verb. For if the translation of: "the lion which appeared in my dream" is *tüsh-üm-da körgän sher*, then the translation of "the lion which is in the jungle" would naturally be "*jangal-da ikan sher.*" But instead of that they say: "*jangal-da-gi sher.*" Thus *gi* takes the place of *ikan*, and the idea is suggested that it may be a contraction of the same. For the Yarkandis often say *ikin* for *ikan*, and I have found one example of this being further contracted to '*ki*'. [Ex. *bu qai-si paighambar-ning ruh-i 'ki* "what prophet's soul may this be?" where the full expression would be "*qai-si paighambar-ning ruh-i ikan.*"] The quasi-Pronoun *ki* (see Pronouns) points to the same derivation. Thus *maning-ki* is the idiomatic expression for "that which is mine;" but it may be taken as a contraction of *maning ikin*, which would mean the same. See also "Derivation of Adjectives (b)" *kin-gi, yetkan-gi, &c.*, p. 279.

Take the following : *Turkistân-da-gi khalq Musalman boldi* ; *At maning-ki, eshak saning-ki* ; *Kin-gi âdam yetinadi* ; in each of these cases the word *ikin* or *ikan* might be

Ex. : *Biz-ga ham ZAKÂT-NING ŞUÂBI-NI TÂP-QU-DIQ** *bir ish-ni*

Us to also customs of merit (acc.) likely-to-obtain one work (acc.)
buyur-sunlar. viz., "Command to us also some work that may be likely to command.

obtain (for us) the merit of customs (paying)."

9. A conditional sentence is usually expressed without any 'if' by putting the verb into the Potential:

Ex. : "*Şuî Butkhâna-ning tâm-i-ni siz qupâr-sa'ngiz.*"

Lit. That Idol-temple of wall (acc.) you may raise.

viz., "If you raise," &c., or "should you raise."

10. With the adverb '*ilgari*' meaning *before*, the verb (in the form of the Infinitive Verbal Subst.) is put in the negative:

Ex. : *Ul Sultân bu 'âlam-gha kel-MAS-din nichand yîl ILGARI* :

that Sultan this world to coming not than several years before

English—"some years before that Sultan had come into this world."

(Cf. "avant qu'il ne fut venu au monde.")

So also with the verbal affix "*ghuncha*" "whilst", to produce the meaning 'until.'

Ex. : *mulaqât bol-MA-GHUNCHA* = 'whilst a visit had not been paid' or visit being not whilst

'till a visit was paid.'

(Cf. "tant qu'une visite n'avait pas été faite.")

11. There are two ways of quoting a statement made by another person (or an opinion ascribed to him), answering to the English forms: (a) That which professes to give the very words of the speaker in inverted commas; (b) "He said that" followed by the third person (of the supposed speaker).

substituted for *ki* or *gi* grammatically though not idiomatically: *Turkistân-da İKAN khalq Musalmân boldi* "the people that are in Turkistan have (has) become Musalmân," *At maning İKAN, eshak saning İKAN* "the horse (is) what is mine, the ass what is thine," *Kin İKAN âdam yetmadi* "the man who is (or was) behind has not arrived." (This may be shown to be grammatically a correct form, by substituting other verbs: e. g. *Turkistân-da turghan khalq*, "the people who stay in Turkistan"; *kin qalghan âdam* "the man who remains behind"; *maning bolghan at* "the horse which becomes mine.") So that the particle *ki* or *gi* in all the meanings described respectively under Pronouns, p. 232, under Adjectives of Relation, p. 279, and as taking the place of the English relative pronoun, here p. 283—in all these applications seems to be a corruption of the Participle *ikan* or *ikin* of the verb substantive.

It must not be confounded, as some grammarians have done, with the conjunction *kin* (Persian *kih*) used in that language and in Osmanli Turkish to supply the place of a relative Pronoun but which is really a mere "connective" having the Personal Pronouns understood (or expressed) after it. See Forbes' Persian Gram. § 68: e. g. *An kin chun pistah didam-ash hama maghz* "He whom I saw &c." Lit. "He, that I saw him &c."

* Here *tâp-qu-diq* is the Participle of Probability; so that this sentence is of the form described above under § 8 (a).

(a). The former is rendered in Turki by prefixing some expression, such as "*Dédi*" or "*añti kim*" = "he said", "he said that" (though this is sometimes omitted) and finishing with the participle "*De'p*" = "having said." These take the place of our inverted commas to mark the beginning and end of the quotation.

Ex. : AIDEJAR *Al-hamdu-l-Ilah* *talab-im* *muyessar boldi*,
They said "Thank God (the object of) my search has-been obtain-

DEP.

ed," having said.

(b). The other form is rendered in Turki by putting the quotation in the words of the speaker, with this exception that the subject (or nominative) of the sentence quoted is in the accusative, as being the object of the governing verb 'he said' or 'he thought.'

Ex. : SANI *üldi dédi* = He said that thou wert dead.

Lit. thee he died he said.

Which may be rendered, "he reported *thee* dead," or "he said (of) thee, he is dead."

Here "*sani*" (thee) is governed (in the accusative) by the verb "*dédi*" (he said), while the statement itself is in the actual words of the speaker, of which the above pronoun in the accusative forms the subject (unless we may suppose a nominative *he* understood).

Biz-ni àlur-m'ikin dep parwàh gelmai = without fearing lest
us will-they-take having said care making not

we should take (it).

[Here the *biz-ni* (acc.) seems to be governed by the "*dep*," and not by the "*parwàh gelmai*" which would govern the ablative "*biz-din*."]

12. The reflective pronoun *öz* is used (like *khud* in Persian, or *áp*, *apna* in Hindustani) instead of a demonstrative or possessive pronoun, to fix the meaning on the subject of the sentence.

Ex. : *Ya'qub öz-i-ning át-i-ni ultur-di* = Ya'qub killed his (own) horse.

Ya'qub ANING át-i-ni ultur-di would mean : Ya'qub killed his (*viz.*, some one else's) horse.

Again : *Man sani öz-öng-ning üi-ng-da kör-döm* = I saw thee in thy (own) house [here the termination *öng* leaves no doubt of the person].

But, '*Ali Ya'qub-ni öz-i-ning üi-da kördi*, is a doubtful phrase ; for though by rights the *öz* should refer to the subject of the sentence (*Ali*), yet as the accusative "*Ya'qub-ni*" comes so close before, it would probably be understood to mean : "Ali saw Ya'qub in his (Ya'qub's) own house." To save the doubt it would be better to put it as follows :

Ya'qub-ni 'Ali öz-i-ning üi-da kördi = Ali saw Ya'qub in his (Ali's own) house.

While to express the other meaning without leaving a doubt, the reflective pronoun would be dispensed with, and the demonstrative used, *viz.*

'*Ali Ya'qub-ni ANING üi-da kör-di* = Ali saw Ya'qub in his (Ya'qub's) house.

It is the same with the other cases (*öz* taking the proper possessive affix of the person): Ex. *man öz-üm-ni urdum* "I struck myself."

Ya'qub öz-i-din qurqti "Ya'qub feared (from) himself."

13. There being no verb "to have," its sense is expressed by means of the impersonal verb *bâr* "there is."

(a) by putting the subject in the locative:

Ex.: *man-da dt bar* = there is to me (*i. e.*, "I have") a horse.

Pâdshâh-da üi bâr = there is to the king a house, *i. e.*, the king has a house."

(b) by putting the (English) subject in the genitive; and the (English) object in the possessed form of the proper person:

Ex.: *Maning ât-im bâr* "my horse exists" or "I have a horse."

Pâdshâh-ning ât-i bâr "the king's horse is (or exists)," *i. e.*, "the king has a horse."

Of course with the addition of the demonstrative pronoun the verb *bâr* would resume its simple meaning of "is."

Ex. *Bu maning ât-im bâr* = "this is my horse."

14. The passive forms of intransitive verbs are not impossible in Turki. Sometimes they are in point of meaning the passive of the causative rather than of the primary intransitive verb, which can of course have no passive logically [See "Secondary verbs, II," note at end]. But often again they take a kind of impersonal sense answering to the French form in "*on*." Thus with *bâr-mâq* "to go;" *bâr-il-di* is its passive past tense, 3rd person singular. Literally it would be translated "it has been gone," which comes to mean "one has gone" "*on est allé*."

15. The Noun of the agent in *chi* governs the same case as the primary verb, as also do all other verbal forms.

Ex.: *KUFFÂR-NI yoq-qelghu-chi*. "A destroyer (of) infidels (acc.)."

16. To represent the expressions which employ the infinitive in European tongues, the Turki employs its own infinitive or other verbal noun as a noun in the accusative or other case.

Ex.: *QEL-MÂQ-NI kh'ahlâi-man* = I wish to do.
the doing (acc.) wish I

Yelghân AITMAK gunâh dur = to tell lies is a sin.

Or the form in *gali* may be used, answering to English "in order to."

Ex.: *ültür-gali buyur-di* = he commanded to kill, or, he gave orders for the killing.

âl-gali kel-dim = I came (in order) to take.

17. In interrogative phrases only one syllable or word of interrogation is necessary. Thus, if the words *nima* (what ?), *qâi-si* (which ?), or generally, any interrogative adverb, appears in the body of the sentence, the final interrogative *mu* or *ma*, or the dubitative *m'ikin*, is not required. Otherwise it is ;

Thus : *NIMA bâr* " what is there ?" but, *shubu bâr MU* " is it this ?"

Again : *Bu qâi-si païghambar-ning ruh-i ikin*, " What prophet's soul may this be ?"

but : *Bu fulân païghambar-ning ruh-i m'ikin* " May this be such-and-such a prophet's soul ?"

END OF THE GRAMMAR.

APPENDIX.

TRANSLATIONS AND SELECTIONS.

YÄRKANDI TÜRKI VERSION OF THE LORD'S PRAYER.

Eh ! bizlar-ning kök-da-gi dâda-'miz,

Oh us of Heaven-in Father-our ;

Saning at-ing ulugh bolsun ;

Of thee name thy great be ;

Saning pādshāhliq-ing kelsun ;

Of thee kingdom thy come ;

Saning rizāliq-ing asmān-da bolghan-dik, yer-da ham bolsun ;

Of thee pleasure thy Heaven-in being like earth-in also may it be ;

Biz-nīng āzuq-umiz-ni har-kön yet-kuz ;

Us-of food our (acc.) each day cause-to-reach ;

Biz yamān-liq qelghan-lar-gha baghishla-ghan-cha gunāh-

We bad-ness doers to forgiving-in-the-measure-of sin

imiz-ni baghishla ;

our (acc.) forgive ;

Gunāh-boladurghan waqt-ni kursāt-ma,

Sin about to be opportunity (acc.) present-not

Magar biz-ni yamānliq-din qut-qāz ;

But us (acc.) bad-ness from protect ;

Aning-uchun-kim pādshāhliq u kuchluk-lik u roshan-lik san-ga

Of this because that kingdom and power and glory to thee

mango dur. Amin,

evermore is Amen.

STORIES

FROM FORBES' PERSIAN GRAMMAR TRANSLATED INTO TURKI.

1. *Bir ádam Aflatun-din sur-di kim : Tola yil-lar kîma-da iding,*
 One man Plato-from asked that Many years ship-in thou wert
wu daryâ-safar-i-nî gel-ding, daryâ-da nîma 'ajâib-lar kôr-döng.
 and sea-voyage (acc.) thou madest sea-in what wonders sawest-thou.
Jawâb âidi 'ajab shubu ir-di kim daryâ-din salâmat yaqâ-si-*
 Answer he spoke wonder this very (thing) was that sea-from safely shore its
gha yet-tim.
 to I arrived.

2. *Bir gadû bir bâi-ning darwâza-si-ga bâr-di wu bir-nîma†*
 One beggar one rich-man-of door his to went and something
tila-di. Uî-ning ich-i-din awâz kel-di kim : Aghacha üi-da yög.
 asked (for). House of interior-its-from voice came that : Woman house-in not.
Gadû de-di nân‡ parcha-si-nî tîla'p-idim, aghacha-nî tîla-ma'p-
 Beggar said bread piece of it (acc.) asked-for I had woman (acc.) I had not asked
ilim kim shun-dâgh jawâb tâp-tim.
 (for) that such-like answer I received.

3. *Bir tabîb har-wagt qabristân-gha bâr-ur bol-sa chûdir-i-nî*
 One doctor every time grave-yard to going might be sheet his (acc.)
bâsh-i-gha yaf-in-ip (yap-in-ip) bârur-idi. Adam-lar sur-di-lar kim : Mu-ning
 head his to having-wrapped-himself used-to-go. Men asked that : This of
sabab-i nîma. Tabîb âidi : Bu qabristân-da-ghî ülûk-lar-din uwat-
 reason its what (is) ? Doctor said : This grave-yard in being corpses from I-am-
ur-man, aning uchun-kim hama-si maning dawâ-im-nî ye'p
 abashed, that-of because that all of them of me medicine my (acc.) having eaten
ül-üp-dur.
 have died.

4. *Bir kön pâdshah ughul-i bilan du-gha bâr-di hawâ issigh bol-*
 One day a king son his with hunt to went air hot be-
di ; pâdshah bilan shah-zâda igin-lar-i-nî bir maskharah-ning dâlu-
 came ; king with prince cloaks their (acc.) one jester of shoulder-
si-gha qoi-di : Pâdshah kül-di wu de-di : Ai maskharah san-da bir
 his-to placed ; King smiled and said : Oh jester thee on one
eshak-ning yûk-i bâr-dur. Maskharah âidi : Balki iki eshak-ning
 donkey of load-his (there) is. Jester said : or rather two donkey of
yûk-i bâr dur.
 load-their (there) is.

5. *Bir duk-adam-gha de-di-lar, kim : Tild-'r-mu-san kim saning*
 One crooked man to they said, that : desirest ? thou that of thee
ucha-ng tughrî bol-sun, ya hamah adam-lar-ning ucha-si san-dik
 back thy straight should-become, of all men of back their thee like

* *Âidi* for *ait-di* from *ait-mak*.

† Lit. "one what."

‡ For *nân-ning parcha-si-nî*.

duk bol-sun—mu. Ul duk de-di, hamah kishi-lar-ning ucha-
crooked should become ? That crooked (man) said : all people of back
si man-dik igri bol-sun, ul köz-bilan mani köra-dur-lar man
thou me like crooked should become, that eye with me (acc.) they-are-seeing I
ham ular-ni kör-ai.
also them (acc.) may-see.

6. *Bir kön Pádshah bir sha'r-din aghri-di; jallad-ni biyur-*
One day King one poet from was angry; executioner (acc.) he-
di; maning aldi'm-da ül-tür. Jallád qilich alip- kel-ga-
ordered of me presence my in kill. Executioner sword having-taken in-order-to
li bár-di. Ul sha'r házir ádam-lar-gha de-di; Qilich kel-guncha*
come went. That poet present men to said: Sword till-coming
mani musht-la'nglar wu ur-unqlar kim Pádshah-ning kungl-i khush
me (acc.) belabour and beat that King of heart his pleased
bol-sun. Bu söz-din Pádshah khush bol-up kül-di wu sha'r-ning
may-be. This speech from king pleased having-become he-smiled and poet of
gunáh-i-ni út-ti.
offence his (acc.) passed over.

7. *Bir ádam ulugh martaba tàp-ti. Bir dost-i ani kör-gáli*
One man great dignity received. One friend his him in-order-to-see
kel-di. Ul ádam de-di: San kim san wu nima ish-ka kel-
came. That man said: Thou who (art) thou and what business to camest-
ding. Ul dost-i sharminda bol-di wu de-di: Mani tanu-ma'-
thou? That friend his abashed became and said: Me (acc.) recognisest not
m'-san.† Man saning kadím-gi dost-ung man; san-ga 'iza tut-
? thou. I of thee old (adj.) friend thy I (am); thee to condolence in-or-
qali kel-dim ishit-dim kim gârghu bol-up-san.
der-to-offer (hold) I came I heard that blind thou-hast-become.

TRANSLATION OF A PASS-PORT ISSUED IN KASHGHAR.

To

All Road and Station officials at this time,

This notice (is given), that at this season of auspicious arrangement, Shaw Sâhib's man Rahmat-Ullah, with a horse, is going to Yârkand on service. It is necessary that you, without offering molestation or impediment‡ at the road-stations (either) in (his) going or coming, pass him on and

* *Alip-kel-mak* (lit. having taken to come), i. e., to bring; *alip-kel-gali* = in order to bring.

† Contracted from *tanu-mâi-mu-san*. *Tanu-mak* is "to recognise;" *tanu-i-san* "thou recognisest" (simple Pres.); *tanu-mâi-san* is the negative "thou recognisest not;" *tanu-mai-mu-san* is the interrogative "dost thou not recognise." See "Verbs Interrogative."

‡ Lit. "not having made molestation and impediment."

forward him. With this intent,* on the eleventh day of the Holy month Rámazán 1291, the exalted sign-manual has been impressed.

(on the reverse)

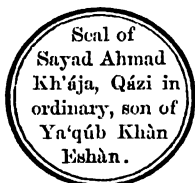


(Seal of the Amir).

TRANSLATION OF AGREEMENT WRITTEN AT KASHGHAR.

"The date was one thousand two hundred and ninety, the nineteenth of Muharram: Maláq, the son of Qábil Baï, made a legal agreement (as follows): that on account of contentions (with) my wife Aqlim Bibi, I, who now agree, having been unreasonable, henceforward† have undertaken not to strike or beat‡ (her) without reason; to give (her) the necessary cost of living at the (proper) time, and have undertaken not to take any strange man into the house where my said wife is§ and whenever it shall be known and proved that I have taken|| a strange man into my house into the presence of my wife, or have beaten|| her without just cause, my said wife shall be free¶, if she chooses, to give to me the writer of this agreement, one** bill of divorcement separating herself."

Agreed to by both parties in Court. (Arabic).



* Lit. "having said" or "signified (thus)." The usual participle, *de'p*, which closes a quotation.

† *Mun-dín bu-yàn*; Lit. "on this side of this (time)."

‡ *Soqmas boldin*; Lit. I have become not-about-to-strike: " *Soqmas* is the negative of *Soq-ur* (Continuative Participle).

§ *Ahl-im bür üi-ga*. The root of the defective verb *bür* is here used as a Verbal Adjective.

|| *Kirgan-im, soq-gan-im*, Verbal Substantives in the possessed form; lit. "my entering," "my striking." *Alip-kirmak* is a compound verb = "having taken, to enter" = "to take into."

¶ Lit. "having obtained the option, if she pleases, let her &c."

** One out of the three which Musalman law allows before the divorce is irrevocable under ordinary circumstances.

OPINION OF ONE OF HIS HIGHNESS THE AMIR OF KASH-
GHAR'S COUNSEL LEARNED IN THE LAW.

TRANSLATION.

Case put :

(Whereas) by his statement (it appears) that, as was pre-ordained, a sum of thirty-three tangas was lost from the house of Sufúrgi Baï from his bed, and afterwards Sufúrgi Baï said to (his) wife Aï Khán: "If you have put away this money, thirty-three tangas, produce it, (and) I will add twenty-four tangas, and will make a cloak after your heart's desire and give (it to you) [*or*, will cause to be made (for you) &c.] ; (and) if (when) you have produced the money, I should not add the (other) money and give you the cloak, and should not stand to my promise, (then) be you thrice divorced." Thus he made* conditions.

[*Opinion :*]

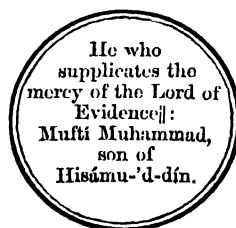
Under these circumstances, according to the terms of the Holy Law, the said Aï Bibi may not have produced the money, and Sufúrgi Baï may not have given the twenty-four tangas to the said Aï Bibi; (but) the said Aï Bibi does *not*, by a breach† of Sufúrgi Baï's promise, become divorced three times as against‡ Sufúrgi Baï. *And God knows best.* (Arabic.)

"That which depends on a condition does not come into operation in the absence of that condition." (Qází Khán.)§

"That which depends on a condition is wanting previous to the existence of the same." (Niháya.)§

"And every thing which depends on a qualification does not come into operation without the existence of the same." (Doubtful.)§

[Seal.]



* All the verbs, excepting those supposed to be spoken by Sufúrgi Baï, down to this point, are in the Potential form as being dependent on the statement of the applicant.

† The negative expressed in the concluding verb applies to the preceding clause also. The phrase might be rendered "It is *not* the case that Sufúrgi Baï has broken his promise, and that (therefore) Aï Bibi has become divorced."

‡ Lit. "to the injury of."

§ These Arabic quotations are from the books of expounders of the law brought in as authorities for the decision come to. The authorship of the last is entered as "doubtful."

|| Or, "the manifest Lord."

EXTRACTS
FROM THE TAZKIRATU-'L BUGHRA.
(*Literal translation.*)

EXTRACT I.

* * * * *

One day a disciple* of the holy Abu-an-nasar Sámání inquired: "Oh; Reverend man, so much goods and wealth† being (in your possession), why do you (*lit.* they) carry on commerce?" he said: Then the holy Kh'á-jah Abu-an-nasr Sámání said: "Oh disciple, you say well; but since I have come to my wits I have never at any time set aside the traditions of the Holy Prophet of God. Therefore I do not choose to neglect them (*lit.* the neglecting them). When I go out on a journey (*lit.* in my going out to a journey) by paying customs (*lit.* having given customs), I cause advantage to Musalmáns; should I abandon trade I should remain excluded from the merit of paying customs."

And again he spoke: "Oh disciples, have ye not heard this story? One day the Prophet of God had sat down in the Blessed Mosque. Several indigent companions (of the Prophet) came in (*lit.* having entered, came). They said: 'Oh Prophet of God, other companions (of thine) (who are) rich, pay customs. To us also command some work that may obtain (for us) the merit of customs (paying), (that) we also having done that work may obtain the merit of customs (paying).' Thus they petitioned (*lit.* having said they made petition).

"The Holy Prophet said: 'Oh poor companions, daily the service of morning prayer having been recited, if you say thirty-three times '*Subhán-allah*;' thirty-three times '*Al-hamdu-'l Illah*;' thirty-three times '*Allahu akbar*;' ten times '*La Iláha ill' Allah, wahdahu, la-sharíka lahu, lahu'l-mulku wa lahu-'l-hamdu wa hua 'ala kulli shai-in qadír*,'‡ ye will obtain the merit of giving customs. (Thus) saying he commanded."

"These indigent companions remained very happy. Some days after the rich companions having heard, they also recited (the words). These poor companions having again come into the presence of the Holy Prophet of God, said: 'Oh Prophet of God, the rich companions also having recited the prayers which we have to recite (*lit.* the us-to-be-recited prayers), are obtaining the merits of these also!' thus they represented.

* Here the word "disciple" is put in the plural out of respect, although a single one is indicated by the word *bir* "one." This is a very common usage. Abu-an-nasr seems to have lived in the 4th century after Muhammad.

† *Lit.* "to that extent goods and wealth having stood."

‡ There is no Divinity but Allah alone. He has no partner; Dominion is His, and praise is His, and His power extends over all. A.

"Then the Holy Prophet said: '*Zalika fazl-ullahi yutihi man yashà*';* that is: 'God the Exalted gives the merit of (paying) customs to (whatever) servant of His he chooses (lit. to his chosen servant). I, how shall I do (anything)?' Thus he answered.

"Therefore it is known that in (paying) customs there is exceeding profit. To this end I have not abandoned commerce," he said.

EXTRACT II.

'It is that Abu-an-nasr Sâmání' said the Holy Prophet of God 'who shall acquire Sultán Satuq Bughra Khán for the Faith.'

At once the companions computed the date and wrote: 'After the Prophet of God shall have passed from the world three hundred and thirty-three years, in the land of Turkistán, one by name the Holy Sultán Satuq Bughra Khán Ghází, a noble person, shall come into existence; at the age of twelve he shall be acquired to the Faith.' Thus they wrote.

And again on the spot the Prophet of God spoke: "*Awwalu man aslama min at-Turk.*"†

The meaning of this saying is this: as much as to say that: 'from the direction of Turkistán Sultán Satuq Bughra Khán Ghází will become a Musalmán.'‡

So that after a certain period the Holy Kh'ájah Abu-an-nasr Sâmání came into existence in this world; as he went on reading the revealed knowledge, he saw this saying: "*Awwalu man aslama min at-Turk.*" 'What sort of a person may this Sultán Satuq Bughra Khán be' he said (to himself). Without having seen him he began to love him.

He looks§ at the date; but little (time) remains to the coming into existence of the Holy Sultán. His love and friendship coming off victorious he started on a journey in search of the Sultán, in the direction of Turkistán.

* * * * *

EXTRACT III.

The Holy Sultán Satuq Bughra Khán Ghází entered the twelfth year of his age.|| Until that (time) the Holy Sultán was in appearance an infidel.

* Lit. "That is the grace of God which falls upon whomsoever He chooses." A.

† Lit. "The first who professed Islám among the Turks." A.

‡ This is of course a very free rendering by the pious historian, for in the Prophet's traditional saying no name is reported.

§ Lit. "he might look," Pres. Pot. But this tense is used in an historic sense like the "historic present."

|| He appears to have been the son of a King of Káshghar of the family of the mythic Afrasiab.

One day the Holy Sultán went out a-hunting. Going along hunting he arrived at a place called *Baqu* in Lower *Artúsh*. He looked ; (and saw that) several men of pleasing appearance and of pure disposition had encamped on a grassy spot. The Holy Sultán, with his companions, started in the direction of these travellers.

Having looked, they were astonished saying : " In these cities there were not (ever) such people, such men. What people are these ? Come ! let us go and see." (Thus) saying they moved on.

But these travellers* were the Holy Kh'ájah Abu-an-nasr Sámání (and his company). Abu-an-nasr† looks‡ : several horsemen are coming. They came near. He looks (again) : it must be the Holy Satuq Bughra Khán (whose mention he had) seen in the History (of the Prophet's sayings).

On seeing (him) Abu-an-nasr said : " Thanks be to God, (the object of) my petition has been obtained,"§ and he rejoiced exceedingly.

Immediately he said to his servants : " The Lord of the present and future worlds, (the object of) my desire comes. Or rather, the reason of my coming to this country was because of this noble person. Oh servants ! leave the baggage open," (so) saying, with Abu-an-nasr leading, all the travellers stood up to prayer. Having finished their prayer, they came back to their places and sat down. Till that time the Sultán remained on the back of his horse.

The Sultán, astonished, said : " (These) are|| wonderful travellers ; without caring for us, leaving their baggage open, they have become occupied in striking their heads on the ground."

He was (saying) these words, (when) Abú-an-nasr came seven steps of ground into the presence of the Sultán, and made a salutation. The Sultán, getting off his horse, went to meet the Kh'ájah Abú-an-nasr. The Kh'ájah invited¶ the Sultán and brought (him) with honour and respect to the place (where he was) sitting ; bringing out his best goods by pairs to the Sultán, he placed these choice things in (his) presence.

Then the Sultán with heart and soul accepted (the attentions of) the

* *Kárwán* is used in Central Asia to mean one of the persons composing what we should call a "caravan," and not to mean the entire assemblage, as is indeed evident from the word in the text being in the plural.

† The long titles are omitted for brevity.

‡ The "historic present."

§ The word "do'p" (having said), which comes in here, may be taken as answering to our inverted commas.

|| *Duk* for *dur* (respectful form).

¶ *Taktif qelmág*, a common Oriental expression for "to invite". Cf. French "donnez vous la peine d'entrer."

Kh'ájah. As it was in the Sultán's mind, (that) the Holy Khizr had said some one should be produced who should teach him Musalmánism,* he doubted whether this might not be the very person. He asked: "What (is your) name"? Then the Kh'ájah answered "my name is Abú-an-nasr Sámání."

The Sultán recognised that this must be the person spoken of by Khizr† (on whom be peace).‡ He rejoiced and said: "Oh father, whatever you may say I will agree to. But, while we sat by on horseback, you left your baggage open, without fearing lest we should take (it), and became lashed in striking your heads on the ground. We know you not. Tell us the truth of these proceedings of yours." (Thus) he spoke.

Then the Kh'ájah said: "Oh, Prince, in this world there is not an abiding world. Every one will go from this world; money, goods, riches, will not satisfy men; but rather by reason of money and goods men become captive to Hell. And again, we all are about making a journey from this world to the next, we have made ready the provisions and accoutrements (fitted) to a person who is travelling from this world." (Thus) he answered

The Sultán having heard this speech from the Kh'ájah, a fear was produced in his heart.

He said: "Oh Kh'ájah, what dost thou say (when) about to become a Musalmán; I also will say it and become a Musalmán."

The Holy Kh'ájah said: "Repeat the *Kalimah tayibah* '*Lá Iláha ill' Alláh, Muhammad Rasúl-illáh*' (there is no Divinity but Alláh, Muhammad is the Messenger of Alláh), (and) the *Kalimah-i-Shahádat* '*Ash-hadu an lá Iláha ill' Alláh, wa ashhadu anna Muhammadan 'abduhu wa Rasúluhu*' (I testify that there is no Divinity but Alláh, and I testify that Muhammad is his servant and his messenger)."

The Sultán said the '*Kalimah-i-Shahádat* (the declaration of testimony) and the '*Kalimah tayibah*' (the beautiful declaration).

Then he asked: "Who is the person (you) call Muhammad?" The Holy Kh'ájah said: "(He who is) called Muhammad (is) the friend of God. God the Exalted has created this world and the next for the sake of that Muhammad. He, on the Day of Judgment, shall release sinners from

* This barbarous compound exactly represents the equally barbarous compound in the text. The entire phrase is literally: "...some one having been produced, that some-one shall teach me Musalmánism."

† The Oriental name of the Prophet Elias, whose apparition to Sultán Satuq is related in a previous chapter of the *Tazkiratu'l-Bughra*.

‡ This clause is followed by the inevitable "de'p" referring to words not spoken but thought.

Hell, and take them to Paradise. The Faith of that Muhammad is right, and his laws (are) right; (they) are not like the laws of other Prophets. The laws of other Prophets are abrogated.* Whoever walks in the path trodden by Muhammad he shall attain his desire and wish." Thus he described the Messenger of God.

Then the Sultán said to the Kh'ájah: "Oh (thou) who showest the way to those who have lost it, if there be any other thing to be taught (to teach) besides the declaration of testimony, teach (me); that I also having learnt (it) may busy myself about the service of God."

* * * * *

EXTRACT IV.

The Holy Sultán having called one by one the forty persons save one, (and they) having come, he said: "Oh friends, if you choose to maintain friendship with me, like me become Musalmán. The Faith of the Holy Muhammad, the Messenger of God, is the greatest of all Faiths‡, and the most distinguished. Into this Faith enter ye. (Thus) he exhorted (them).

* * * * *

EXTRACT V.

The Holy Sultán Satuq Bughra Khán's (step) father§ Hárun Bughra Khán was even worse than a stone in infidelity. His army was numberless. By his sagacity he became aware that Sultán Satuq had become a Musalmán, but, moreover, in order to convince himself the better, he told no one.||

* * * * *

EXTRACT VI.

He formed the project of killing the Holy Sultán. The Sultán's mother having understood this matter, complained, and said: "Oh infidel! why dost thou slay my son, obtained after so many years of mortification and pain?" With such words she intervened.¶

* The text says منسوخ و باطل 'abrogated and false,' but the Musalman transcriber refused to copy the word باطل 'false', saying this would be wrong theology, as the laws of Moses and Christ are only superseded by the laws of Muhammad, but are not false in themselves! However, the word باطل has the meaning 'abolished' as well as 'false.'

† Lit. "Oh shower (of) the road to the road-losers."

‡ A good example of the Superlative.

§ He seems to have married Satuq's mother after the death of her former husband, Satuq's father, and become King in his place.

¶ Lit. "With sagacity he ascertained the Sultán's becoming a Musalmán. But, moreover, query that it may be better known, (thus) saying (to himself)," &c.

¶ Lit. "Descended in the midst."

many people have held it lawful to do forbidden acts. If in laying out the wall you lay it out with the (mental) purpose, saying (I intend this as) a mosque, certainly in the presence of God you will obtain merit, (and) you will be delivered from the evil designs of the infidels. Be not over-much afflicted.”*

The Sultán Satuq having heard these words, rejoiced (and) returned home.

In the morning (when) the sun rose Hárun caused to make proclamation, saying: “Let all the troops and chiefs assemble at the place (where) the temple is to be built.” All the infidels assembled at the place (where) the temple was to be built.

Hárun having sent and fetched the Holy Sultán, said: “Oh child! if you are of our faith, do the same works that we do. What we bow† the head to, do you also bow (your) head to. We, this day, are building a temple. Do you first, leading, place the bricks; our heart will at once‡ become at ease.”

The Holy Sultán said: “Very well,” and of his own accord tucking up the front§ (skirt of his robe) to his waist, and turning up the sleeve of his fore-arm, with all his friends, (forming) the (mental) intention of (building) a mosque, lifting up the bricks by twos, he went and took and deposited them at the place for building the idol-temple.

The third time he had gone to take|| a brick, Hárun called out saying: “Oh, my child! my son! stop; more than this it is not in my power to cause your body to work.¶ Even now there was an object of mine in my causing you to do thus. Now my heart has become at ease. Now whatsoever you may please, (that) do.”

Having said (this) the whole of his troops returned and settled down.

* * * * *

EXTRACT IX.

The Sultán, having spent half the night, went with those forty persons less one into the presence of the Holy Kh’ájah.

“Oh Venerable one! If you give me the advice, I will make an assault and have a hit at** the infidels. Perhaps God the Exalted will give us victory.”.....

* *Fareshán* for *pareshán*.

† Lit. “The wo-head-striking thing.”

‡ Literally, “on that (spot).”

§ *Fesh* for *pesh*.

|| Lit. “saying ‘I will take.’”

¶ Lit. “there is no power of mine to the causing to work your body (acc.).”

** *Tig-mak* means “to hit” as a bullet hits the mark, or as a horse-load hits against a rock.

EXTRACT X.

The Holy Kh'ájah and the Sultán, with all their friends, arose and set out.

They arrived at the palace of Hárun Bughra Khán. The Holy Kh'ájah raising his hands made a prayer: "By Thy Divine grace and favour give the infidels a deep sleep, and to the Musalmáns give victory." Thus he prayed. At that moment, in fulfilment of the Holy Kh'ájah's prayer, (God) gave to the infidels such a (deep) sleep, that one might seize one (of them) by the waist and drag him out,* (and) none of the others would be aware of it

* * * * *

EXTRACT XI.

The Sultán Satuq, dismounting from his horse and baring his sword, entered Hárun's palace.

He looks, Hárun Bughra Khán remains asleep. One of his servants sits attending to the lamp.

He raised his sword to cut off Hárun's head.† Again it came into his heart that the killing of an enemy in his sleep is the part of a coward.‡ 'It is best to awaken this infidel from his sleep, and exhort him to the Faith.§'

Again he paused and said: "However much an infidel he may be, I have eaten his salt. I will respect the claim of salt."

Thus saying, he touched his leg with the point of his sword, and said: "Hárun Bughra Khán!" Awaking suddenly he looks;•(and behold) Sultán Satuq Bughra Khán, with his drawn sword presented at his head, stands there.

This infidel said: "Oh Sultán Satuq, having all this wealth, for what reason dost thou such a deed."

Then the Holy Sultán replied: "Oh infidel! The best of deeds is this, that thou do what I do. Arise, the time is short. Consider (this) opportunity (as) valuable. Say this holy profession of faith: 'there is no Divinity but Allah, Muhammad (is) the Messenger of Allah.' Repeat (it)" he said. .

That luckless infidel consented not. However much the Sultán insisted, this hellish (one) consented not, guided by God to become a Musalmán.

* Lit. "Having seized by the waist of one (of them), (any one) would be likely to drag him out."

† Lit. "Saying 'I will cut off' &c."

‡ Lit. "Comes out from un-manliness."

§ Lit. "That is the good (course) that having awakened this infidel from his sleep, I should make him desirous of the Faith."

The Sultán several times brandished his sword to cut off his head.* Again he considered : " I have eaten his salt, he has a father's claim," and returned his sword. Finally having brought his hundred desires to the threshold of God, (who is) beyond (all) desire, he prayed saying : " Oh great God ! Thou seest the state of all creatures, (and thou hast seen) how many times I raised my sword to cut off his head, but respected his father's claims and the claim of the salt. Although there may be (this) father's claim (on me), oh God, by thy avenging attributes, cause this infidel to be swallowed in the earth." Thus he prayed.

The Holy Sultán's prayers were accepted ; the earth trembled, the earth was split, and swallowed up Hárún Bughra Khán to the knees.

The Holy Sultán said : " Oh infidel, seest thou what has happened.† Come ! profess the Faith.‡ I will pray for thee.§ Free thyself from this evil." Thus he exhorted.

That wretch replied : " It is better for me to enter into the earth than to enter into thy religion."|| So he consented not.

(The earth) swallowed him in up to the neck. Still he consented not. The Sultán's wrath arose. Again he prayed. The earth swallowed up Hárún Bughra Khán, and he was not.

At that auspicious moment a ray of light proceeded from the dawning of day. The Holy Sultán exclaimed : " Beat the drum of Islám in my name ; go forth and say, that it is (now) the rule of Sultán Satuq Bughra Khán Ghází. Shout loudly the invitation to prayer." Thus he issued his commands.

EXTRACT XII.

The Holy Sultán Satuq Bughra Khán, at the age of twelve and a half, became occupied in wars of religion. During the summer he made war on the infidels. In winter-time he performed the service and worship of God the Exalted.

The Sultán Satuq Bughra Khán Ghází until his ninety-sixth year, as far as the River Amu that is before Balkh¶ on this side towards sun-

* "Saying, I will cut off his head."

† Lit. "this state of affairs."

‡ Lit. "bring faith."

§ Lit. "to thee." But "*du'd*" must be understood as a prayer to God, or intercession.

|| Lit. "my entering the earth is better, &c."

¶ Lit. "the in-front-of-Balkh river Amu."

rising* as far as the place called "Karák" on the north as far as the place called "Qarà-qurdum"† [sic] (the said) Sultán, having converted the infidels to Islám by his sword, established the laws and religion of the Holy Muhammad, the Messenger of God, and gave them currency.

..... They buried the Holy Sultán at a place called *Mashhad* in Lower *Artush*, in (the country of) *Kashqar*.

..... At the time of the Holy Sultán's leaving this world, the date was *four hundred and twenty-nine*.‡.....

EXTRACT XIII.

The King Sultán Satuq Bughra Khán Ghází had§ four sons and three daughters. The name of one (of the) daughters (was) '*Ala-núr Khànem*. Now '*Ala-núr Khànem* was a sainted lady|| of very pure appearance and chaste disposition, of right faith and firm belief¶; and her story is like that of the Blessed Mary [may peace be with her]. In this wise: that when she had arrived at maturity, one night she was worshipping God the Exalted; the Holy Gabriel [on whom be peace] came and distilled a drop of light into her sacred mouth.

Fainting she lost her consciousness. Again she returned to life.

Another tradition is, that one night she was going out to the door. At the door (behold) a lion is standing. At the sight of the lion the perspiration bedewed (her brow). Her consciousness forsook her; again she returned to life. After many days, after many months, on the tenth of the month Ashur, on a Friday at the time of assembly for prayer, a son came into existence, of ruddy countenance, with the eyes of a gazelle.

Great and small, all remained in wonder, saying: "What manner of an occurrence is this?" The king in anger commanded, saying: "Ascertain the truth of this matter."

The nobles, the learned, and great men, questioned '*Alanúr Khànem*. She related the circumstances one by one. The assembled sagacious and wise men, and the learned and great, full of awe, exclaimed: "It is the Holy '*Alí*."

* Probably for *kön qish* (which has no sense), should be read *kön chiqish* which has the sense given above. Otherwise it might read "as far as *Kun-qish Karák*."

† The whole passage is confused in the original as is shown in the translation.

‡ Answering to A. D. 1037. The dates given agree with the age ascribed to Satuq Bughra Khán when he died, viz. 96 years. He is said to have been born in A. H. 333, and to have died in A. H. 429.

§ Lit. "of the king . . . there were four sons," &c.

|| *Za'ifa* is used as a term of respect equivalent to "lady"; and *marhúm* is used of the faithful dead.

¶ Lit. "mistress of certainty."

Deriving the lineage from that Holy personage, they named him saying : " Let his name be *Sayad 'Alí Arslán* Khán*.....

After the Royal Prince Sayad 'Alí Arslán Khán had reached the age of seven, (they) married 'Ala-núr Khánem to Toq Buba Bughra Khán according to law. From them were born three sons ; these are† Muham-mad Arslán, Yusuf Arslán (and) Kizil Arslán Khán Pádsháh.

EXTRACT XIV.

It is related by tradition that the Holy Sultán Satuq Bughra Khán's eldest son Hasan Bughra Khan was king at Káshqar. At that time *Juqta Rashíd* and *Nuqta Rashíd*, *Jigálu-álkhalkhál*‡ of China, came with an army of thirty thousand, and beleaguered the city of Káshqar for a certain time.

In the scarcity when the Musulmán's became straitened, having distributed all the provisions (of every sort),§ these did not suffice, and they were reduced to the last extremity. Lest he should become|| answerable for (the deaths of) these Musulmán's, Hasan Bughra Khán (together with) Yusuf Qadir Khán, Sayad 'Alí Arslán, with all their nobles, taking a force of forty thousand (men), issued out of the city and drawing up their army, stood fast. The infidels also drew up their line of battle and stood.

They threw themselves on the infidels, and dispersed¶ them. The infidels in flight went to the town of Yangi-Hissar.....

EXTRACT XV.

The Holy Sayad 'Alí Arslán, taking a force of ninety thousand (men), pursued the infidels. Fighting with them as they went, he joined battle with them at a place called *Urtang Qara* (the Black Station). Here also there were several thousands of infidels. Attacking them, he caused the blood of the infidels to flow like the River Jaihún.** Sword and battle-axe had no effect on the Holy Prince. The infidels remained in astonishment. The *Jigálu-álkhalkhál* said : " Sword and battle-axe have no effect at all on him ; nothing pierces him. How may (one) do (that) a sword shall pierce the

* *Arslán* means 'lion,' referring to the story of his birth.

† *Duk* for *dur* is a respectful form.

‡ I venture to suppose that this word (unknown to those natives of Turkistán whom I have consulted) is a corrupted Chinese or Kalmák name of some dignity or office.

§ Lit. "Water and food."

|| Lit. "Saying, 'Let me not be answerable for these Musulmán's.'"

¶ *Farákanda* for *parákanda*.

** The Oxus. Lit. "From the infidels he caused to flow a Jaihún of blood."

Holy Prince? Whoever may be likely to give intelligence (of) this, I will give (him) the equivalent of his (own) stature (in) gold." Thus he promised.

At that time there was an old man of Ujât* amongst the infidels. He said: "I will accomplish this work."†

He betook himself with guile to the army of Islâm. For several days he went to and fro in the army, (and) entered into the service of the Prince's kitchen. No one paid any attention to him.

One day (the Prince) had returned from the holy fight and sat down. He related several occurrences of the fight, and (the man of Ujât) having praised and commended the Prince, asked a question, saying: "Oh Prince, Refuge of the World, sword and battle-axe have no effect on your Highness. What circumstance is this?"

The Holy Sayad 'Alî Arslân in his good-humour, said: "At no time does a sword or battle-axe pierce me. Except (that) when I stand up to prayer, my body becomes water; at that time if (any one) were to strike me with a reed (even) he would pierce (me)." (The old man) was going about attentive (to discover) what (was) the case and what (were) the circumstances of this magical power. He heard this speech from the gem-scattering (lips) of the Holy Prince; no one became aware of the matter.

This traitor, having gone out from the midst of the army, told (the) good news to the Jigálu-álkhalkhál of China. This infidel rejoiced and gave much gold and jewelry to this traitor.

* * * * *

EXTRACT XVI.

One day they were calling to morning prayer. The Musalmáns assembled and stood in rows. They performed the instituted rites; and saying the *Takbîr*‡ for the religious duty, they arose to prayer.

The Surah§ (beginning) "Verily we have given" was in the mind of the Mullá Imám.|| But "Verily we have granted a victory"¶ came to his mouth.

* I am informed by a resident of Khotan that *Ujât* is a village near the capital of that province; and that, in connection with the occurrence mentioned in the text, there is still a saying current applied to a disloyal or treacherous person: "He is an *Ujât-liq*." See note at end of this Translation. In Eastern Turkistán the word *Kampîr* used in the text, generally means an old woman. Perhaps it should have been translated so here.

† Lit. "the work (acc.) of this."

‡ The words "God is greatest" with which the prayers begin.

§ Chapter of the Korán. The chapter beginning thus is the 108th, a short one.

|| The Mulla who leads the prayer.

¶ This is the beginning of the 48th chapter of the Korán. The verse quoted below is the 28th-29th of the same chapter.

The infidels were on the alert ; they considered the opportunity valuable. Entering (the field) rank on rank they sent the Musalmáns to martyrdom ; and just as they (the worshippers) reached this verse—"and God is a sufficient witness, Muhammad is the Messenger of God"—a sword struck the sacred head of the Prince. The head was severed from the body. From the sacred head of the Prince there came a voice :

"Well, it is a careless Mullá" it said.

His proper name was "Mullá 'Alam." The nick-name "Kh'ájah Bó-gham" (careless Kh'ájah) became affixed to him.*

* * * * *

EXTRACT XVII.

The infidels urged their horses against (the Prince's) household these (men) stood still and fought. They made over ever so many infidels Hell. The attacking infidels finally made martyrs of them.

Then the Lady Mariam Khánem, with several (of her) maids, draw ; a sigh of grief, entered the battle. They sent five and twenty infidels Hell. The unbelievers came on to the attack. She looked at the cart (or help). The earth split ; at that moment she entered the earth and appeared. After that they slew the maids.

* * * * *

EXTRACT XVIII.

The Holy *Hasan* Bughra Khán Ghází, the Holy *Isan* Bughra Khán Ghází, the Holy *Yúsuf Qadír* Khán Ghází, these Princes entered the plain. Killing infidels, they made the blood to flow (like the River) Jaihún ; they cut (them) in pieces, and took their goods as booty.

Juqta Rashíd and Nuqta Rushíd, Jigálu-álkhalkhál of China, with a force of twelve thousand (men), fled. (The Princes) pursuing after, reached (the place) called *Kukiár*.† There they fought for seven nights and days. Many Musalmáns became martyrs. With all this fighting, (matters) did not come right. Othman Bughra Khán, a son of the Holy Sul-tán, with sixty persons, met with martyr's deaths. The infidels, fighting as they went, retreated to a town of China.

* * * * *

* A certain "*Hazrat Begam*" is revered as a local saint at Qizil. I was much exercised at hearing this saint spoken of as a *man* ; whereas the title would mean "the Holy Princess." But perhaps it is the "Kh'ájah *Bégham*" of the text, who has been converted by local superstition into a saint, like Pilato.

† The last village on the winter route to Tibet, south of Yarkand.

EXTRACT XIX.

The Holy *Yúsuf Qadír* Khán Ghází and the Holy *Hasan* Bughra Khán Ghází came to the town of *Yárkand* and dwelt (there). They persuaded the people towards Islám. By the point of the tongue* they became Musalmáns, and professed the Faith. The people made an offering of their money and goods, their lives and bodies. They gave all of them to the poor.

On behalf of this people (the Princes) prayed for a blessing. All the Musalmáns said 'Amen.' The prayer on behalf of these Musalmáns (converts) met with acceptance. It is said that by virtue of this prayer the city of *Yárkand* shall never be destroyed.....

* * * * * *

EXTRACT XX.

Then they came to the place (where) the Holy Sayad Prince '*Alí Arslán* Khán Ghází (had been) martyred.....The Holy Sultán *Hasan* Bughra Khán Ghází having bared his head, and fixing† his eyes on Heaven, opened his hands‡ and prayed. The Musalmáns said 'Amen.'

The prayer was as yet not finished when a dark whirlwind arose. It was as if the sky and the earth were about to become one.§

After a short space of time the storm passed away. The world became bright (again). They look! (and behold) sand has settled over the martyrs; salt has settled on the infidels. For that reason they gave (to the place) the name "Qum Shahidán" (martyrs' sand).||

* * * *

.....After this (the Sultán *Hasan* Bughra Khán) arose with all his troops and set out for *Káshqar*. He went and sat on his throne. The whole people of *Káshqar*, weeping tear upon tear,¶ like the rain of early spring, made mourning (for '*Alí Arslán*).....

.....They say it was in the year four hundred and eighty-nine,** the tenth of the month '*Ashur*, a Friday,†† (that) the Prince Sayad '*Alí Arslán*

* As distinguished from the "point of the sword."

† Lit. "Sewing."

‡ In the manner usual in the Musulmán's prayers.

§ Lit. "It became as if about to make the sky the earth, and the earth the sky."

|| Still known by that name, to the South-East of *Yangi-Hissár*.

¶ Lit. "Lamentation and lamentation."

** A. D. 1095.

†† This date of the month and week seems to be ascribed as a matter of course to every event of any importance or solemnity. '*Ashur* is really not a month, but the tenth day of the month *Muharram*,

Khán Ghází partook of the sherbet of Martyrdom, drank the purifying draught and became a martyr.

EXTRACT XXI.

It is related that these Princes, (namely) the Sultán *Hasan* Bughra Khán Ghází, the Prince *Isan* Bughra Khán, the Prince *Husain* Bughra Khán, and the Prince *Yusuf Qadír* Khán, sat on the throne of sovereignty for twelve years.

In their time if they saw or heard of any one not dressed in a turban,* they used to drive an iron nail into his head. (The state of) cultivation was such that no one would take a 'chárak' of grain (if offered) for a "pul."†.....

EXTRACT XXII.

These Princes were sitting on the throne of abundance (when) it was reported to the Maulána Sa'íd of Káshqar‡ that one hundred persons, with their three chiefs, were coming as Ambassadors from Turkistán.

"Let them enter" said the king.

Kh'ájah 'Abdu'llah of Turkistán (and) Kh'ájah Abu-Bakr of Tàshkand entering kissed the earth in several places and stood up.

The king (said): "May you not suffer fatigue or hunger! What is your condition?§ Ye have suffered|| privation and trouble." Thus he questioned them.

They also having made obeisance said: "Oh King, Protector of the World, the land of Turkistán has lapsed into infidelity. We have come to ask for the intercession of Your Highness." Thus they petitioned...

These Princes having gathered together a countless host beyond all reckoning, rode into Turkistán

When they had reached Turkistán,¶ all the people, great and small, of their own accord, came and professed obedience. They were collected together at the king's gate.

* Lit. "turban-not-putting on person." *Ki-ma-gan* is the negative Indefinite Participle of the verb *Ki-mak*.

† A modern "chárak" of grain is about 15½ lbs., and a "pul" is about the tenth part of a penny.

‡ Lit. "They gave news to the Maulána.... saying: 'one hundred persons....

§ *Nihátíng* for *Ni hál-íng* "what (is) your condition."

|| Lit. "drawn out."

¶ The town and district called "Hazrat Turkistán" or "Hazrat Sultán" after the Saint "Sultán Ahmad Yasáwí," whose shrine is mentioned below. It lies north of Tàshkand, in what is now Russian Turkistán.

After this the Holy Sultán, having made a procession round the shrine* of the King Kh'ájah Ahmad Yasáwí, prepared food and drink, and gave (it) to his army.....

The Holy Sultán remained during that summer and winter, and conquered the whole of Turkistán and Tàshkand. The next† year he again rode forth.....

He went through city by city, tribe by tribe, striking with his father's‡ sword, walking in his ways, and alighting in his alighting places. Having defeated the infidels from the River Amun§ to the Sea Qulzum as far as Qurđum||, by the gleam of his sword Islám became refulgent, and the pathway of the commandments was opened. The Faith of Islám (and) the religion of Ahmad [Muhammad] were firmly established. Up to this time several years passed. They then consulted, saying: "Let us return to the land of Káshqar. News has come that the land of Káshqar is drowned in infidelity."¶

Immediately they made proclamation on proclamation saying: "Let the army be assembled." The army was assembled.

The Sultán *Hasan* Bughra Khán said to the Prince *Yúsuf Qadír* Khán: "Go you to Madain, make petition to the Holy Imáms, saying: the land of Káshkar has gone over to infidelity we believe. We desire help from Your Holinesses." Thus make your petition, he said.

The Prince *Yúsuf Qadír* Khán went to Madain.** The King *Hasan* Bughra Khán came with seventy thousand men and sat down to besiege the city of Káshqar. They killed all these infidels, and made blood to flow (like the River) Jáihún. The Musalmáns met with victory.

The infidels having brought over the people of Káshqar to their own faith, (these) had eaten the flesh of dogs, asses and pigs, (and) considered unclean snakes to be lawful (food); (thus) they had become and remained unrestrained infidels††.....

* "*Mažárát-lar*" a double plural of respect.

† "*Sung-qi*" = "ágo-walla" (Hind.)

‡ *Jáfib* for *chápib*; *fudar* for *padar*, P.

§ For *Amu* (the Oxus).

|| *Qulzum* means the Red Sea usually, but also any other sea or lake. *Qurđum* means in Turki a place where waters disappear in the soil. (*Qurđum Qáy* is the name given to the district where the Yárkand River disappears after stagnating in lakes and marshes.) But this *Qurđum* is perhaps the same as the *Qura* (black) *Qurđum* mentioned in Ext. XII, and is perhaps intended for the *Kara-koram* of Chingiz-Khan (by an anachronism). However, from what comes after, it might be thought that all those places should be in Western Turkistan.

¶ The Hear-say Tense in *mish*.

• • • Identified with the old city of Ctosphon, on the Tigris.

†† A good instance of the favourite Turki formation of sentences.

From the side of the infidels *Juqta Rashid* entered the plain. From the side of the Musalmáns the Prince *Isan* Bughra Khán entered the plain, and showed forth his bravery. He declared his name and lineage, and entered the battle-field. He fought in such a manner that his praise cannot be fittingly spoken.*.....

* * * * *

EXTRACT XXIII.

In fine they thus relate: that these four Imáms were at Madáin. They had gone out on a three-months' hunting excursion. The Prince *Yúsuf Qadír Khan* standing respectfully in the Presence, made petition "Oh, Seed of the Prophet of God! we come from Káshqar. The land of Káshqar has become entirely infidel. If victory be not obtained in the time of such descendants of the Prophet as you, after this there will be no victory. If your permission be given, should there be a certain force of Islám with us, please God the Exalted, if God shows favour, having gained the victory we will come to the door way of your Holinesses."

The Holy *Imám Násru-'d-dín* said: "Oh Chiefs! Quickly collect an army, and go (forth) with His Highness the Prince *Yúsuf*; if ye should be defeated, send a despatch to us." Thus he commanded.

* * * * *

EXTRACT XXIV.

His Highness *Hasan* Bughra Khán Ghází gave commandment: "Let an army be collected. No quarter is to be given to infidels."

In three days the army was collected. Taking the whole force, he went and encamped at the town of Yangi-Hissár. With its advanced posts at *Altunluq* (and) its rear (extending) to *Urtang Qara*, the infidel (army) was lying encamped. They fought for some days..... At that time several hundred infidels, making a sortie from the mountains, began to slaughter the Musulmán. Then *Husain†* Bughra Khán foaming at the mouth, (and) bellowing like a mad camel, made fierce war. He moved on, causing the blood to flow (like the River) Jaíhún. By the Heavenly decree, being struck with arrows in several places, he fell a Martyr.....

EXTRACT XXV.

His Highness *Hasan* Bughra Khán came into the plain Becoming exhausted, he raised a cry of grief and threw himself (on the foe). He caused the blood to flow from the infidels (like the River) Jaí-

* Lit. "that it will not come rightly into laudation."

† Here "*Isan*" should probably be read instead of "*Hussain*."

hún. Arrows struck the Holy King in several places. A flood of blood was poured forth. *Nuqta* Rashîd severed the sacred head of the Holy King from his body.....

After the Holy *Hasan* Bughra Khán Ghází had suffered martyrdom, the infidels slaughtered* all the Musalmáns. (It was) as if the Last Day had come. The light of the world became darkness.....

EXTRACT XXVI.

His Highness *Yúsuf Qadír* Khán was at Madaïn..... Hearing that *Yúsuf Qadír* was coming from Madaïn with an army of a hundred thousand men,† *Juqta* Rashîd fled away with all his forces to the cities of China.

The people of Káshqar took valuables and presents, and went to meet the Holy *Yúsuf Qadír* in the Mountains of *Andijàn*. They pressed the skirt of his robe to their eyes, and kissed his feet.....

EXTRACT XXVII.

They further relate that the Prince *Yúsuf Qadír* Khán took forty thousand men to‡ obtain vengeance for his father's (death). Having besieged *Khotun* and fought for twenty-four years, he took the land of *Khotan*, and slew the *Jigálu-álkhalkhál* of China. (Thus) he took vengeance for his father:

He brought (away) the goods and booty of *Khotan*; (on) the banks of the *Khán-Arikš* he bought the Seven-Villages (*Yetti-kent*) of *Tüzghun* (at the rate of) a "chárak"|| of land for one 'misqâl' of gold, and dedicated (them) to religious uses.

.....He returned to Káshqar by the upper road, and encamped at a place called *Qizil*. It being the place proper for building a "Langar"¶ in honor of the Holy Sayad *Arslún* Khán, he ordered a tank to be dug. Immediately they set to digging the tank. Loosening the ground with the points of

* Lit. "Caused to arrive at martyrdom."

† Lit. "Saying, *Yúsuf Qadír* is believed to be coming" (the Hearsay tense in *mish*).

‡ Lit. "Saying: 'May I obtain &c.' ".....

§ Or "Royal canal;" it is known by that name to this day, and is situated between *Yengi-Hissár* and *Káshghar*. *Tüzghun* means "stream." It is also the name of a River and district in the locality noted above.

|| A "Chárak" of land is the extent which can be sown with one "chárak" of seed. A "chárak" of grain is about 15½ lb. A 'miscal' of gold is the seventh part of a "sér" (3¼ rupees weight); at modern rates it is worth between 14 and 15 shillings. Land which took 1 lb of seed to sow was therefore bought for about 1 shilling.

¶ A "Langar" is a traveller's rest-house connected usually with some shrine.

their arrows, each man* carried away a handful of earth. In one day, it is said, the tank was completed.....†

EXTRACT XXVIII.

‡The Holy Imáms having seen the letter, said :

"Oh friends ! a letter has come to us from the land of Káshqar. We are going in order to conquer the infidels. We have§ no other work than this."

.....They started in the direction of the land of Káshqar...After some time, having made Yúsuf Qádir Khán king over the land of Káshqar, (the Holy Imáms) set off in the direction of China. Having come there they sat down before a (certain) town. The infidels remained amazed at this army. At that time Juqta Rashíd had a magician. (This man) said : "Oh my King, why are you thus distressed. Is it necessary for them to see the town in order to take it, or can they take it without seeing it ?||

Juqta Rashíd exclaimed : "Oh Vizier, what speech is this ? The city stands evident to the view,¶ (yet) he speaks thus !"

The magician responded : "However many days that army may stay here, (so long) will I conceal the town."

Juqta Rashíd having saluted him sat down. All the infidels were glad, and beat a roll on the drum of rejoicing.

Morning came. When the Holy Imáms had concluded their prayers, they ordered a certain one (saying) : "Go in (to the city) and say : These who have come are the descendants of the Holy Mustafa** (on whom be God's mercy and peace). Their Holy names are Imám Násiru-'d-dîn, Imám Mu'ínu-'d-dîn, Imám Zuhúru-'d-dîn, and Imám Qiwámu-'d-dîn. They have come from Máwara an-Nahar in order to conquer the land of Káshqar, with an army of a hundred and forty thousand. They have ordered me (saying), go in and say to those infidels, hang your bows about your necks, come into my presence and become Musalmáns professing the Faith. If they do not profess the Faith, beginning with Juqta Rashíd,

* Lit. "By head of man."

† A similar story was told me at Qizil itself, where also I obtained my copy of the *Tazkiratu'l-Bughra* (see Shaw's High Tartary, page 240).

‡ The story here returns to the time when Yúsuf Qádir had obtained assistance from the Imáms of Mada'in, while Hasan Bughra Khán had gone on ahead (Ext. XXII) to recover Káshghar, and had been killed (Ext. XXV). We seem to have here a slightly different tradition.

§ Lit. "There is to us."

|| Lit. "Seeing will they take the town, will they also take it not seeing ?"

¶ Lit. "Standing showing itself."

** The Prophet Muhammad.

we will kill all the infidels, capture their children, and destroy their towns.”*

Having heard these words, the light of the world became darkness to the infidels. The infidels considered and said: “We will not turn back from our faith.” They pitched a green tent on (the roof of) the palace. The *Shamàn* leading, one and forty magicians became occupied in their magic.

They (the Musalmáns) prepared to fight. The city disappeared. They recognized that the magician must have exercised (his) enchantments. Morning broke, the city became visible again. They beat a roll on the battle drum. At the moment when the bold soldiers were urging their horses to the battle, the city disappeared.

In the same manner for forty years they fought together at (this) town of China. Finally one night Juqta Rashîd with all his army, fled.

* * * * *

EXTRACT XXIX.

The Holy Imáms started in pursuit of Juqta Rashîd and Nuqta Rashîd.

.....The Imáms were at prayers, The infidels, finding the occasion opportune, slew† the Holy Imáms like sheep, at the time of prostration.

Then they all fought for the standard,‡ and cut off its bearer’s hand. Without giving up the standard, he seized it between his knees. They cut off his (legs at the) knees also. He (then) held on to it with his neck (and shoulder). They severed his neck. The standard, soaring into the air, disappeared. The sun was eclipsed,§ the world became darkened. A voice came from the sky, a murmur came forth from the earth; the infidels went off towards China. One man fled and went to Káshqar, and gave the news to the King *Yúsuf Qádir Khán*.

Yúsuf Qádir Khán at once rode forth; (riding) night and day he arrived, and (when) he saw the sacred heads of the Holy Imáms severed from their bodies, his senses left him. Again, he became conscious, and saw that the bodies of men were lying scattered like the stones of the wilderness. He wondered at not being able to distinguish between infidels and Musalmáns.||

* Lit. “having killed, &c.,.....he destroys.” Here the quotation is not kept to the proper person of the verb.

† Lit. “cut the throats.”

‡ Lit. “saying, let us take the *tugh* (a standard made of a Yak’s tail).”

§ Lit. “eclipsed.”

|| Lit. “saying, it is not known whether infidels or Musalmáns, he remained in wonder.”

He prayed, a thunder-storm arose, water flowed down from the mountains, rain fell from Heaven ; it placed the faces of the Musalmáns in the direction of the ' Qibla ' ; it turned the infidels' bodies face downwards, and carried away the heads of the unbelievers.

Then they took the Holy Imáms' sacred bodies, and placed them in coffins. The other Musalmáns' bodies they buried.

The date was five hundred and ninety-six [A. D. 1199]. On the 10th day of the month Zi-'l Hajjah, a Monday, the Holy Imáms drank of the sherbet of martyrdom.

" But God knows best what is the truth."*

NOTE ON THE UJATLIQS.

[In the " Report of a Mission to Yarkand under Sir D. Forsyth, K. C. S. I." (Calcutta 1875) in the History of Káshghar, p. 127, Dr. Bellew on the authority of the " Tazkira Bughra Khan" with reference to a passage translated in Extract XV (above), says: " A poor and aged *Jútlie* = Christian priest.....came forward as a candidate for the offered reward." Now although it is not to be denied that there were Nestorian Christians in Eastern Turkistán at that time and later, I cannot think that there is any reference to them in the present text. The word in my copy of the work (*Tazkiratu-'l-Bughra*) is distinctly *اوجاتلیق* " Ujätliq", and besides the evidence given in the note at the place (see above), I find the name " Ujât" occurring as the name of a town or village in a modern song called " the Maids of Turkistán," extending to 22 lines and celebrating the peculiarities of the maidens of different towns of Kashgharia. The following will suffice as a specimen :

اوزي توزوك بيله اوزوك كاشقر ليك ننگ قزلاري - اوزي كلته بويي خالته
 ينك حصان ننگ قزلاري - اوستون پوقاق قوبان پوزداق ياركندليك ننگ
 قزلاري * * * * * چينه تخنه كا تيزگان آلمه ختن ايلچي قزلاري - كشمش اوزوم
 تولاييگان اوجات ليق ننگ قزلاري * * * * * كيگان قالپاق پشانه يالپاق
 سريقول ننگ قزلاري - بورني پوچوق تيلي سچوك قرغزلار ننگ قزلاري *

Which may be rendered thus :

" Straight and slender-waisted are the maids of Káshghar.

" Short, with sack-like figures, are the maids of Yangi-Hisár.

" A goitre above, fat below, (such) are the maids of Yárkand.

* * * * *

* This saving clause is added by the transcriber. It is of course Arabic.

“Arranging apples on saucers are the maids of Khotan-Ilehi.

“Eating many currants and grapes are the maids of UJĀT (of the Ujāt-liqs).

* * * * *

“Wearing felt caps, with foreheads wide (or high) are the maids of [Sariqol.

“Snub-nosed, (but) sweet-tongued are the maids of the Kirghiz.”

The reference to the foreheads of the Aryan Sariqolis is interesting.

After the foregoing portion of this note was in the press, I came across a passage in the later part of the *Tazkiratu'l-Bughra* which settles the question about the religion of the *Ujāt-liqs*, and shows them to have been Musalmáns, though bad ones. It is as follows :

آیدی ای پادشاهم اوجات دیب برپاره خلق بار انیزگ خلقي نیلیدا
مسلمان دور دین دا جاسوس لوق قیلیب قاچقان کامرلار ننگ ارته سیدین
نامه ایباریب دور دیب حضرت امام لارغه عرض قیلدیلار

“He said : ‘Oh my king ! there is a set (?) of people called *Ujāt*. The people of that (?) place or tribe) are Musalmáns with their tongues, but their (real) religion is spying. Having spied they have sent letters after the infidels who have fled (*lit.* they are in tongue Musalmáns, in faith doing espial, they have sent &c.).’ Thus he represented to the holy Imáms.”

This character of spics and traitors is that in which the *Ujāt-liqs* are represented each time in the *Tazkiratu'l-Bughra*. With this agrees the popular saying regarding them recorded in the note to the original passage (Ext. XV. above).

In a versified account of the same events as are recorded in the latter part of the *Tazkiratu'l-Bughra*, I find the following parallel passage :

دیدى ای پادشاه نیک صفات کنتمیز بار الے اتارلار اوجات
ظاهر دینغه قیلادر اترلار لیک کونکلیدا کوب عداوتی بار
دیدیلار انداغ اولسه اهل اوجات تاپمغایلار ایکی جهاندا نجات

“He said : ‘Oh king (possessed) of good qualities, we have a village which they call Ujāt ;

In appearance they assent to the (true) Faith, but in their hearts they have much enmity.’

They (the Imáms) replied : ‘If the people of Ujāt be so, they will not obtain salvation in both worlds.’”

In the same book I find the following verses which identify the my-

thical personages Juqta Rashîd and Nukta Rashîd as the then chiefs of Khotan :

ایکي کانر ختن کا شاہ ایردی ختن اہلي انکا سپاہ ایردی
بري سينر دیر ایردی جو قتر رشید بڻه سک آئینہ نکتہ رشید

“Two infidels were kings of Khotan, the people of Khotan were their soldiers ;

“One of them they called Juqtá Rashîd ; the name of the other dog Nukta Rashîd.”

In the Tazkiratu 'l-Bughra we hear of Juqta Rashîd and Nukta Rashîd from a little later than 429 A. H. (A. D. 1037) until 596 A. H. (A. D. 1199). They are probably mere representative names. Khotan seems here to be considered as belonging to China. R. B. S. 1877.]



STORIES

FROM FORBES' PERSIAN GRAMMAR TRANSLATED INTO TURKI.

- ۱ بر آدم افلاطون دین سوردی کیم تولا یل لار کیمه ده ایدینگ و دریا سفرینی قیلدینگ دریا ده نیمه عجایب لار کوردونگ جواب آیدی عجایب شبو ایردی کیم دریا دین سلامت یقاسیغه ییتدیم *
- ۲ برگدا بر بای نینگ دروازه سیغه باردی و بر نیمه تیلادی آوی ننگ ایچیدین آواز کیلدی کیم آغاچه آویده یوق گدا دیدی نان پرچه سینی تلاب ایدیم آغاچه نی تلاماب ایدیم کیم شونداغ جواب ناپتیم *
- ۳ بر طبیب هر وقت قبرستانغه بارور بولسه چادرینی باشیغه یافنیب بارور ایدی آدم لار سوردیلار کیم موننگ سببی نیمه طبیب آیدی بر قبرستانداغی اولوک لار دین آواتور من آننگ اوچون کیم همه سی منینگ دوایمنی ییب اولوب دور *
- ۴ بر کون بر پادشاه اوغلی بیلان آوغه باردی هوا اسمیغ بولدی پادشاه بیلان شاهزاده ایگین لارینی بر مسخره ننگ دالوسیغه قوبدی پادشاه کولدی و دیدی ای مسخره سنده برایشاک ننگ یوکی بار دور مسخره آیدی بلکه ایکی ایشاک ننگ یوکی بار دور *
- ۵ بر دوك آدم غه دیدیلار کیم تیلار موسن کیم سننگ اوچانگ توغری بولسون یا همه آدم لار ننگ اوچاسی سننیک دوك بولسون مو اول دوك دیدی همه کشی لار ننگ اوچاسی مننیک ایگری بولسون اول گوز بیلان منی کورادورلار من هم اولارنی کورای *
- ۶ بر کون پادشاه بر شاعر دین آغردی جلدنی بیوردی مننگ آلدیمده اولتور جلد قلچ آلیب کیلگالی باردی اول شاعر حاضر آدم لار غه دیدی قلچ کیلگونچه منی مشت لانگ لار و اورونگ لار کیم پادشاه ننگ کونکلی خوش بولسون بو سوز دین پادشاه خوش بولوب کولدی و شاعر ننگ گفا هیفی اوتدی *
- ۷ بر آدم الوغ مرتبه ناپتی بر دوستی آنی کورگالی کیلدی اول آدم دیسی سن کیم سن و نیمه ایش کا کیلدینگ اول دوستی شرمنده بولدی

و دیدی منی تانرماسن من سننگ قدیمگی دوستونگ من سنکا عزا
توتقالی کیلدیم ایشندیم کیم قارغو بولوب سن *

COPY OF PASSPORT ISSUED AT KÁSHGHAR.

بو اوجورده تاممی
یولچی قراول چی لارغه

اعلام بوکه بو ایام سعادت انتظامده شاه صاحب نے * آدمی رح
الله برآط برلان یارکندگه خدمت که بارادر کراک کیم سیزلار پول قراول
لارده بارعوچه کیلگوچه دخل و تعرض قیلمای اوتکارذب یوبارینکلارذب
ماه شریف رمضان نے * اون بری کونے نشان عالی پتیلدی
سنه ۱۲۹۱



COPY.

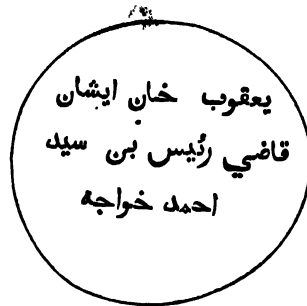
Agreement made at Káshghar.†

تاریخ ۱۲۹۱ بر میزنگ ایکی یوز توقسان محرم نینگ اون توتوزی ایردی
قابل بای ننگ اوغلی ملاق قرار شرعی قیلدی که اهلیم اقلیم بییدی مجادلہ
قیلغان جہت دین من مقرر نامعقول بولوب موندین بویان بیوجہ ضرب
ولت سرقماس بولدیم و نفقہ سیغے و قنیدہ بیریب مذکور اهلیم بار اویکا
اجنبی آدمی نے آلیب کرماس بولدیم و هر وقت اجنبی آدم نے اویوما
اهلیم نینگ آلدیغہ آلیب کرا لیم و یا بیوجہ شرعی سوققانیم معلوم
و ظاهر بولسه مذکور اهلیم مخیرہ بولوب اگر خواہلاسه اوز نفسی نی من

* نینگ for نے.

† This was found between the leaves of books purchased in Káshghar.

مقرغه بر طلاق باين حوام قيلسون مع قبولها و كان عدد الثقات *



COPY OF A LEGAL OPINION GIVEN IN KÁSHGHAR.*

مسئله

مونينگ بيانيدا کيم بر تقديري سفورگي باي نينگ اويديين کات
دين اوتوز اوچ تنگه فلي يوقايب کينکلن بولسه بعده سفورگي باي
خاتوني آي خانغه اوشبو اوتوز اوچ تنگه فل نه آليب قويغان بولسانگ
ظاهر قيلغيل من يگرمه تورت تنگه فل قوشوب کونکلوونگ خواه لاغان
ايگين نه ايتيب بيراي اگرس فل نه ظاهر قيليب من يگرمه تورت تنگه نه
قوشوب ايگين ايتيب بيرمسام وعدم کا تورمسام سن اوچ طلاق بولغيل
ديب شرط قيلغان بولسه اوشبو صورتدا شرع شريف حکم لاري برله
مذکور آي بيبي فل نه ظاهر قيلماسه سفورگي باي هم يگرمه تورت تنگه
فل نه مذکوره آي بيبي کا بيرماسه سفورگي باي قسمي ده حانت
بولوب مذکوره آي بيبي سفورگي باي ننگ ضرر يکه اوچ طلاق بولمايدور
و الهه اعلم *

لمعلق بالشرط لاينزل عند عدم وجود الشرط قاضي خان
المعلق بالشرط عدم قبل وجوده نهايه

* This was found between the leaves of a book purchased in Káshghar.

و كل ما علق هلي صفته لم يقع دون وجودها اشباه.

ۛۛۛ

الملك المبين
* الراجي رحمت من
مفتي محمدی بن
حسام الدين

EXTRACTS FROM THE "TAZKIRATU-'L-BUGHRA."

EXTRACT I.

بر کون حضرت ابو النصر سامانی نینگ بر مریدلاری سوال قیلدیکه
یا بزرگوار شونجه مال دنیا لاری توروب نیمه اوچون سوداگرلیک فیلا درلار
دیدى آندا حضرت خواجه ابو النصر سامانی آیتیلار کیم اى مریدلار خوب
آیتورسیزلار لیکن من عقلمغه قیلیب حضرت رسول الله نینگ سنت لارینى
هیچ وقت دا ترک قیلغان ایماس آنینگ اوچون ترک قیلشنى خواهلامای
دور من سفرگا چققانیدما زکوات بیریب منفعت یتکوزادور من سوداگر
چیلک نى ترک قیلسام زکوات نینگ ثوابیدین محروم قالادور من دیدیلار
ویزه آیدیلار † اى مریدلار بو حکایت نى ایشتمادنینگ لار مو بر کون حضرت
رسول خدا مسجد مبارکده اولتوروب ایردیلار بر نیچند نامراد صحابه لار کریب
کیلدیلار: آیدیلار یا رسول الله ازگا صحابه لار زردار زکوات بیرادرلار بیزگا هم
زکوات نینگ ثوابینی تاپقودیلک بر ایش بیورسنلار بیزلار هم شول ایشنى
قیلیب زکوات نینگ ثوابینی تاپقایمیز دیب عرض قیلدیلار حضرت
رسول جدا آیدیلار که اى نامراد صحابه لار کونده نماز بامداد نینگ فرضینی
تاب بولغاندین کین اوتوز اوچ مراتبه سُبْحَانَ اللَّهِ اوتوز اوچ مراتبه الْحَمْدُ
لِلَّهِ اوتوز اوچ مراتبه اللَّهُ أَكْبَرُ اون مراتبه لَا إِلَهَ إِلَّا اللَّهُ وَحْدَهُ لَا شَرِيكَ لَهُ
لَهُ الْمُلْكُ وَلَهُ الْحَمْدُ وَهُوَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ دیسانگ لار زکوات برگان نینگ
ثوابینی تاپارسیزلار دیب امر قیلدیلار بو نامراد صحابه لار بسیار خوشوقت

* This is to be read upwards and downwards from the middle.

† آیتیلار for آیدیلار.

بولور قالدیلار نچند کوندین کین زردار صحابه‌لار ایشتیب اولار هم اوقو دیلار بو نامراد صحابه‌لارینه حضرت رسول خدا نینگ کاشلاریغه کیلیب آیدیلار یا رسول الله زردار صحابه‌لار هم بیز اوقودورغان دعانی اوقوب آنینگ هم ثوابینی تاپادورلار دیب عرض قیدیلار اندا حضرت رسول خدا آیتنی لار که ذلک فضلُ الله یؤتیه من یشاء یعنی خدای تعالی زکوات فینگ ثوابینی خواهلان بنده‌سیکا بیرادر من قایداغ آبتای دیب جواب بیردیلار بس معلوم بولا دور کیم زکوات ده بی نهایت ثواب بار ایکن شول جهت دین من سوداگرچیلیک نے ترک قیلما دیم دیدیلار

EXTRACT II.

حضرت رسول خدا آیدیلار سلطان ستوق بغرا خان نی شول خوجه ابوالنصر سامانی ایمانغه مشرف قیلور دیدیلار شول زمان صحابه لار تاریخ کیلیب پتدیلار حضرت رسول خدا عالم دین اوتوب اوج یوز اوتوز اوج یلدین کین ترکستان ولایتیده حضرت سلطان ستوق بغرا خان غازی آنلیغ بر ذات شریف وجودغه کیلور اون ایکی باشلاریدا ایمانغه مشرف بولور دیب فیتدیلار وینه شول یرده رسول خدا آیتنی لار اول من اسلم من التُک بو حدیث نینگ معنی سی اول بولور که ترکستان طرفیدین سلطان ستوق بغرا خان غازی مسلمان بولادور دیگان بولور چنانچه نیچند زماندین کین حضرت خواجه ابو النصر سامانی بو عالمکا وجودغه کلدیلار علم ظاهر نی اوتوب یورگونچه اول من اسلم من التُک دیب بو حدیث نی کؤزدیلار اول سلطان ستوق بغرا خان غازی قایداغ کمرسه ایکی دیب غایبانه عاشق بولدیلار تاریخغه باقسه لار حضرت سلطان نینگ وجودغه کیلش لاریغه آز غنه قالیب دور عشق محبت لاری غالب کیلیب حضرت سلطان نی ایزلاب ترکستان ظرفیغه صفر قیلدیلار × × ×

EXTRACT III.

حضرت سلطان ستوق بغرا خان غازی اون ایکی باشقه کردیلار شونگا چه سلطان کانر صرنیدا ایردیلار بر کون حضرت سلطان شکارغه چقتی

لار شكار قیلا قیلا آستین آرتوشدا بقو دیگان یرگا یتتی لار باقسه لار نچند جوش صورت و پاکیزه سیرت آدم لار علف زارغه توشوندورلار حضرت سلطان هممر لاری برله بو کاروانلار طرفیغه روان بولدیلار کورروب بو شهر لارده مونداغ خلق مونداغ آدم لاریوق ایردی بو نیمه کشی لار ایکی دیب حیران قالیب یورونگلار باریب کورالی دیب روان بولدیلار اما بو کاروانلار حضرت خواجه ابو النصر سامانی ایردی لار خواجه ابو النصر سامانی باقسه لار نچند اطلیغ کیدلدر یقین یتیلار باقسه لار تاریخ دا کورگان حضرت سلطان ستوق بغرا خان غازی ایکانلار حضرت ابو النصر سامانی کورروب آیدیلار الحمد لله طلبیم میسر بولدی دیب بسیار خوشحال بولدی لار در حال خدمتکارلاریغه آیدیلار دنیا و آخرت نینگ سلطانین مینینگ مقصودوم کیدلدر بلکه مینینگ بو دیارغه کیلشیم نینگ باعث شول ذات شریف نینگ طفیلے دین ایردی ای خدمت کارلاریوقنی آچیب قویونگلار دیب خواجه ابو النصر باشلغین همه کاروانلار نمازغه قوردیلار نماز دین فارغ بولوب ینه اورون لاریغه کیلیب اولتوردیلار تا شول وقت غه چه حضرت سلطان آط نینگ اوزه سیده توردی لار حضرت سلطان حیران قالیب آیدیلار عجایب کاروان ایکاندرک لار بیز دین پروا قیلمای یوک لارینی اوچوق قویروب باشینی یرگا اوروشقه مشغول بولدی دیب شبو سوزده ایردی لار حضرت خواجه ابو النصر سامانی یتتی قدم یرگا حضرت سلطان نینگ الدیلاریغه کیلیب سلام قیلدیلار حضرت سلطان آط دین توشوب حضرت خواجه ابو النصر سامانی بیله کوروشتیلار حضرت خواجه ابو النصر سامانی حضرت سلطان نی عزت اکرام بیله توشکان یرلاویگا تکلیف قیلیب آلیب کیلیب اوبدان متاع لار دین ایکی دین ایکی دین حضرت سلطان تحفه آلیب کیلیب الدیلاریده قویدیلار اندین کین حضرت خواجه ابو النصر سامانی نی حضرت سلطان بجان دل قبول قیلدیلار چونکه حوت سلطان ننگ کونگلیده بار ایردی برکمرسه پیدا بولوب مسلمانچیلیق نے بیزگه شول کمرسه اورگاتور دیب حضرت خضر آیتیب ایردی لار شول کمرسه شبو میکین دیب گمان قیلیب سوردیلار که آنلاری نیمه دیب اندا حضرت خواجه ابو النصر سامانی آیدیلار مننگ آتیم خواجه ابو النصر سامانی دیدیلار حضرت سلطان بیلدیلار کیم خر علیقه

السلام آیتغان کشي شبو ايگان ديب خوشحال بولوب آيديلار که اي بابا
هرنيمه ديسانگز قبول قیلائی اما بيز آطایغ نوروب يوکونگرزے اوچوق
قويوب بزنی آلور ميکين ديب پورا قيلماي باشنگزلارنی پرکا اوروشقه مشغول
بولدرنگزلار بيز سيز لارنی بيلمايدورميز شبو ايشنگزلارنگ حقيقتيني بيزکا
بيان قيلينگ ديديلار اندا حضرت خواجه ابوالنصر سامانی آيديلار که ای
پادشاه زاده بو دنيدا تورادرغان دنيا ايماس هر کشي بو دنيادين
کينادور پل مال دولت آدميلارکه وفا قيلادرغان ايماس بلکه پل مال ننگ
سببدين آدم دوزخقه گرفتار بولادور و ينه همه ميز بو دنيادين آخرنگا
سفر قيلادرميز بو دنيادين سفر قيلادرغان کشيکا اوزوق جابدرقني طيار
قيلدرق ديب جواب بيردیلار حضرت سلطان حضرت ابوالنصر سامانی
دين بو سوزني ايشتيب کونگل لاريگا بر قورقجي پيدا بولدي آیدی.
ای خواجه مسلمان بولادرغان نيمه نے آيتينگ من هم آيتيب مسلمان
بولاي ديديلار حضرت خواجه ابوالنصر سامانی آيديلار که کلمه طيبه لا اله
إلا الله محمد رسول الله کلمه شهادت أشهد أن لا إله إلا الله و أشهد أن محمداً
عبد و رسولہ دینگ ديديلار حضرت سلطان کلمه شهادت ني کلمه طيبه
آيتيلار آندين کين محمد ديگان نيمه کشي دور ديب سوردی حضرت
خواجه ابو النصر سامانی ايتنی لار که محمد ديگان خدا ننگ دوستي
دنيا و آخرت ني خدای تعالی شول محمد اوچون خلق قيلغان اول قيامت
کوني گناه گارلارني دوزخ دين خلاص قيليب بهشت کا آليب بارور
اول محمد ننگ ديني راست و شريعت لاري راست اوزگا پيغمبولار
نينک شريعتی دیک ايماس اوزگه پيغمبولارنگ شريعتی منسوخ هرکشي
محمد يورگان يولده يورسه مراد مقصود يغه ييتارلار ديب حضرت رسول
خدانی بيان قيلدیلار اندين حضرت سلطان خواجه ابو النصر سامانی
غه آيتني لار که ای گمراه لارغه يول کورساتکوجي لار کلمه شهادت دين
بولک يينه اورکاتادرغان نيمه بولسه اورکاتينگ من هم اورگانيب خدا
ننگ طاعتيگه مشغول بولای ديديلار *

EXTRACT IV.

حضرت سلطان برکم قرق کشی فی بردین چرلاب کیلیب آیدی
ای یارانلار اکر منینگ برله آشناچیلیق قیلشنی خواه لاسانگلار منگا اوخسه
مسلمان بولونگلار حضرت محمد رسول الله نینگ دین لاری همه دین لار
ننگ اولوغی و افضلی تور شول دین غه مشرف بولونگلار دیب
نصیحت قیلدیلار *

EXTRACT V.

حضرت سلطان ستوق بغرا خان ننگ دادالاری هارون بغرا خان کافرلق
دا تاش دین هم یمانراق ایردی لشکری بی نهایت تولا ایردی فراست
بیلان حضرت سلطان ننگ مسلمان بولغانینی بیلدیلار اما تخی مو
اوبدانراق معلوم بولسون دیب هیچ کشیکا آیتما دی × × ×

EXTRACT VI.

حضرت سلطاننی اولتوروشکا قصد قیلدی بو سوزنی حضرت سلطان
ننگ والده لاری آنکلاب فریاد قیلیب آیتنی لار که ای کافولار نچند یل
ننگ بو یوزیکا ریاضت و مشقت بیلان قابقان فرزندیم نے نیمه اوچون
بیگناه اولتوراسن دیب آراغه توشتیلار هارون بغرا خان ننگ اچیغی کیلیب
آیتنی ای مظلوم بیز نینگ دینمزنای ویران قیلیب محمد ننگ مهری
زیاده بولمیی دیدی آیتنی لار که ای کافولار منینگ فرزندیم نی امتحان
قیلیب با قغیل اکر محمد ننگ دینیغه کرگان بولسه اندین اولتورگیل
دیب آیتنی لار هارون بغرا خانفه بو سوز معقول بولدی × × ×

EXTRACT VII.

هارون بغرا خان جمعی بیگلاری بیلان مصلحت قیلیب آیتنی لار
که بر بختانه ایتالی دیب خشت طیار قیلیب برکشینی ایداریب
حضرت سلطان نی چرلاب کیلیدی هارون بغرا خان آیتنیکه ای فرزند

سيزني بيز ننگ دينزددين چقيب محمد ننگ دينيغه كردى ديب گمان
 قيداورميز ديدى حضرت سلطان كافرلار رسميچه انط ايتتني لار هارون بغرا
 خان چين فوتماى ايتني كه اى فرزند بو آنتنگزغه چين پوتمايدورمن بيز
 بر بُتخانه ايتادورميز شول بُتخانه ننگ تا مينى سيز قوپارسانگز چين
 پوتادورمن ديدى حضرت سلطان يوكوروب قوپوپ انديشه قيليب ايتتى لار
 كه قايداغ قيلسام بولور ايكن ديب قبول قيديلار اما يمان پويشان بولديلار x

EXTRACT VIII.

حضرت ابو النصر ساماني ننگ قاشلاريغه باريب ايتتيلار كه اى بزرگوار
 هارون بغرا خان مزينگ مسلمان بولغايميني گمان قيداور مني امتحان
 فيلمات اوچون بر بُتخانه ايتادورميش اول بُتخانه ننگ تاميني اول سيز
 قوپاريب بيرينگ ديدور اگر قبول قيلسام دين اسلام دين چقيب كفرغه
 داخل بولادورمن مزينگ مصلحتيم نيمه ديديلار حضرت خواجه ابوالنصر
 ساماني ايتتيلار كه اى فرزند اوزني محافظت قيليب ساقلاماق اوچون
 بعضى مصنوعات ايش قيلش نى جايز قيليب دورلار اگر تام ساليش
 دا به نيت مسجد ديب سالسانگز خدا ننگ آلدیده البته ثواب تاپارسيز
 كافرلار ننگ بلاسيدين خلاص بولوسيز تولا فریشان بولمانگ ديديلار حضرت
 سلطان ستوق بغرا خان بوسوز ني ايشتيب خوشحال بولدي لار اوبلاريكه
 يانديلار ايرتهسى آفتاب چقيب ايدوي هارون بغرا خان جميع لشكر
 و بيك لار بُتخانه ايتادورغان يرگه جمع بولسون ديب منادى قيدوردي
 همه كافرلار بُتخانه ايتادورغان يرگا جمع بولدي هارون بغرا خان حضرت
 سلطاني چرلاب آليب كيليب ايتتى كه اى فرزند اگر هيز بيزنينگ دينمز
 ده بولساگز بيز قيلغان ايش لارنى سيز هم قيلينگ بيز باش اورغان نيمه كيه
 سيز هم باش اور ننگ بيز بوكون بر بُتخانه ايتادورميز اول سيز باشلاب
 خشت قوروب بيرينگ بيز نينگ كونكلمز شوندا دلجمع بولادور ديدى
 حضرت سلطان خوش ديت ارز رغبت لارى برله فيش لاروني بيل لاريگا
 قوستوروب بلاك لارنى شيمالاب جميع يارالارى برله به نيت مسجد

دیب ایکے دین خشت کوتاریب باریب بُتخانه ایتادورغان یرگه آلیب
باریب قویدیلار اوچونچی مرتبه دا خشت آلائی دیب باریب ایدیلار
هارون بغرا خان قچقویب آیتنے کم ای بالام فرزندیم توختانگ موندین
زیاده بدنیزنی ایش قیلدوروشقه طاقتیم یوق حالا هم سیزکا مونداغ قیل
دوروشومدا غرضیم بار ایردی ایمدی خاطریم جمع بولدی ایمدی هر نیمه
خواه لسانگز قیلینگ دیدی همه لشکرلاری یانیب توشتی x

EXTRACT IX.

حضرت سلطان تون یاریمی نی ارتکزیب بو برکام قرق کشی بیلان
حضرت خواجه ابوالنصر سامانی قاشلاریغه باریب یابز و گوار x...x...
اگر مصالحت نے منکا قویوب بیرسه لار خروج قیلیب کافرلارغه تیککایم
شاید که خدا ایتعالی بیزکا ظفر برکای دیدیلار x...x...x...

EXTRACT X.

حضرت خواجه ابو النصر سامانی حضرت سلطان جمیع یارانلاری بیله
قبوب یولغه روان بولدیلار هارون بغرا خان ننگ اردا سیغه ینتی لار حضرت
خواجه ابوالنصر سامانی قول کوتاریب دعا قیلدیلار که الهی فضل
احسانینک بیله کافرلارغه قاتیغ اویقو بیرگیل مسلمانلارغه ظفر برگیل
دیب دعا قیلدیلار شولزمان حضرت خواجه ابوالنصر سامانی ننگ دعا
لاری مستجاب بولوب کافرلارکا شوفداغ اویقو بر دیلار کیم بری ننگ بیلیدین
توتوب شولرا گودیک بولسه ینده بری ننگ خبر ودا کیچماس ایردی xx

EXTRACT XI.

حضرت سلطان ستوق بغرا خان غازي آطالاردین توشوب شمشیرلارینی
یالانگلاب هارون بغرا خان ننگ اردا سیغه کردیلار کورسه لار هارون بغرا خان
اویقولاب قالیب دور بر خدمتکاری چراغ چقاریب اولتورادر هارون بغرا
خان ننگ باشینی کیسای دیب شمشیرلارینی تنگلاب ینده کونگل لاریگه
ینتی که دشمن نی اویقولوقدا اولتورماک لیک نامردلیکدین چقادر

اوبداني شېو که بوکافر نه اويقوسيدين اوياتيپ ايمانغه ترغيب
 قيلايي . . . x . . . ينه تورروب آيديلار که هرڅه کافر هم بولسه مورتوزيني
 ييب ايديم توزيننگ حقي ني ساقلای ديب شمشير ننگ اوچي بيلان
 فوټيغه سانچيپ آيديلار هارون بغرا خان اضطراب اويغانيب باقسه
 حضرت سلطان ستوق بغرا خان شمشيرلاريني برهنه قيليب باثيدا تنگلاب
 تورادر بو کافر آيتيکه ای سلطان شومداغ دولت سنده تورروب نيمه سببدین
 شومداغ ايشني قيلاسن اندا حضرت سلطان ايتني لار که اي کافر ايش
 ننگ اوبداني شېو که من قيلغان ايس قيلغیل قوبغیل وقت ننگ فرصت
 ني غنيمت بلکل آيتغیل که بو کلمه شريف في لا اله الا الله محمد رسول
 الله ديگيل ديديلار اول کافر بي سعادت قبول قيلمادی حضرت سلطان
 هرڅه جدل قيلدیلار بو جهنمي توفيق تافيب مسلمان بولغالي او
 نامادی حضرت سلطان نچند مراتبه شمشيرلاريني حواله قيلدیلار باثيدي
 کيسای ديب ينه اندیشه قيلدیلار که توزيني ييب ايديم داداليق حقي
 بار ديب شمشيرلاريني ياندردیلار اخر حاجت يوزلاريني بے حاجت
 خدای تعالٰی ننگ درگاهيغه کلتورروب دعا قيلدیلار که ای بارا خدا يا سن
 جميع مخلوقات ننگ حاليفی کورروب توراسن که نچند مراتبه شمشيرنه
 حمله قيلدیم باشيني کيسای ديب اما داداليق حقي ني توزيننگ
 حقيني ساقلاديم اگر چندينکه سببي داداليق حقي بولسه هم خدا يا قهار
 ليق صفتينگ برله بو کافونه يرگا پورتورسانگ ديب مناجات قيلدیلار
 حضرت سلطان ننگ دعالاری مستجاب بولوب يير قيراب يير ياريليب
 هارون بغرا خان نه تيزي غچه يير پوتتي حضرت سلطان آيتني لار که
 ای کافر کوردونگمو بوجالني کيلکيل ايمان کلتورگيل من سندا دعا قيلايي
 بو بلادین خلاص بولغیل ديب نصيحت قيلدیلار بو بدبخت ايتيکه ييرگا
 کيرگانيم بخشيمراق دور سنينگ دينگنه کرونچه ديب قبول قيلمادی
 گالي غچه پوتتي تخي هم قبول قيلمادی حضرت سلطان نينگ غضب
 لاري کيليب ينه دعا قيلدیلار هارون بغرا خان نه يير پوتوب يوق بولدي
 شول زمان سعادت صبح نينگ مشرقدين بر روشن ليک پيدا بولدي
 حضرت سلطان آيديلار که کوس اسلامي مزينگ اتيغه سوقونلار منارغه

چقیب دوری مودوری حضرت سلطان ستوق بغرا خان غازي نینگ دوری
دینگار نماز نینگ آذانی نی بلند اوقونگار دیب امری قیلدیلار xxx

EXTRACT XII.

حضرت سلطان ستوق بغرا خان اون ایکی یاشلاریدا غزاتقه مشغول
بولدیلار یازلیقددا کافرلار بیلله غزات قیلدیلار قیش لیقدا خدای تعالی غه
طاعت و عبادت قیلدیلار حضرت سلطان ستوق بغرا خان غازي توقصان
آلتی یاشلاریغجه بلخ نینگ آلدیداتی آمودریاسیغجه بوطرفه تا کون
قیش کراحت دیگان ییغجه شمال طرفی قراقرودوم دیگان بیرغجه حضرت
سلطان نینگ شمشیرلاری بیلان کافرلاری بیلان مسلمان قیلیب حضرت محمد
رسول الله نینگ شریعت لارینی و ملت لارینی برقرار قیلیب رواج
بولدیلار xxx حضرت سلطان نے کاشقردا آستین آرتوشدا مشهد دیگان یردا
دفن قیادیلار x .. x .. x حضرت سلطان هو عالم دین بارغاندا ناربخنه
تورت یوز یگرمه توقوز ایردی x .. x .. x

EXTRACT XIII.

حضرت سلطان ستوق بغرا خان غازي پادشاه نینگ تورت اوغللاری
اوچ قیزلاری بار ایگان x x x بر قیزلاری نینگ آتلاری اعلا نور خانیم
اما اعلا نور خانیم بسیار پاک صورت و پاکیزه سیرت راست دین و صاحب
یقین طبعیغه مرحومه ایردیلار و اولار نینگ قصه لاری حضرت مریم علیه
السلام نینگ قصه لاری دیک دور انداخ یکیم بلاغت کا یتملار ایرسه
برکجه حضرت حق سبحانه و تعالی غه عبادت قیلور ایردیلار حضرت
جبرائیل علیه السلام کلیب اولار نینگ مبارک آغلاریغهر بر قطره نور تامیز
دیلار بر راحت بولوب هوشلاریدین کیتب ینه هوشلاریغهر کلدیلار و ینه
روایت قیلیب دورلار که برکیجه ایشک کا چققی لار ایشک تویددا بر
شیر تورادور شیرنی کوروب تیر باستیلار هوشلاریدین کیتیپ ینه هوشلاریغهر
کیلدیلار نچند کوندین نچند آی دین کین عشور آی نینگ اونی آذینه
کونی نماز جمعه وقتیدا فرزند وجودغه کیلدیلار قزیل یوزلوک آهو کوزلوک

الوغ کچیک همه حیران قالدیلار بو نچوک واقعه دور دیب حضرت پادشاه در غضب بولوب بوايش نینگ راستیڭني آنگلار دیب امر قیلدیلار آمرالار آخون اکابرلار اعلانور خانیم دین سورددیلار واقعه نی بربر بیان قیلدیلار عاقیل و دابالار و اخون اکابرلار جمع بولوب پور هیئت حضرت علی دور دیب نسب نے شولاردین آلیب آنلارینی حضرت سید علی ارسلان خان بولسون دیب آت قویدیلار حضرت سید علی ارسلان خان پادشاه یتي یاشقه کرگاندین کین اعلانور خانیمنی از روی شریعت توق بوبا بغرا خانغه نسبت قیلغان اولاردین اوچ اوغول وجودغه قلیب دورلار محمد ارسلان یوسف ارسلان قزیل ارسلان خان پادشاه ایکندوک لار xx

EXTRACT XIV.

خبرده انداغ کیلمنوبدورلار کیم حضرت سلطان ستوق بغرا خان غازی نینگ الوغ اوغلانلاری حضرت سلطان حسن بغرا خان غازی کاشقرغه پادساه ایکندوک لار شولوقتده جوقته رشید نوقته رشید چکالو الخخال ماچین اوتوز مینگ لشکر بیلان کیلیت نچند محل کاشقر شهرینی قباب قحطلیک بولغاندا مسلمان لار تنک بولغان مکلدا این همه آب آش بیریب راست کیلمدی ناچار بولدیلار بو مسلمانلارغه ضامن بولمای دیب کاشقر شهریدین حضرت حسن بغرا خان غازی حضرت یوسف قدیر خان غازی حضرت سید علی ارسلان خان غازی جمیع آمرالاری برله قرق منک لشکرینی آلیب شهر دین چقیب صفت تارتیب تورددیلار کافرلار هم صف تارتیب توردی اوزلارینی کافرلارغه اورب کافرلارینی فراکنده قیلیب کافرلار قاچیب ینگي حصار موضعیغه باردی xxx

EXTRACT XV.

حضرت علی ارسلان خان غازی توقسان منگ لشکر نے آلیب کافر لارینی قوغلایب سوقوشا سوقوشا اورتنک فرا دیگان یردا قرار قانتي فرآندا هم نچند مینگ کافر بار ایردی جنک قیلیب کافرلاردین خون جیحون آقتیلار حضرت پادشاه غه تیغ تبر کار قیلما دی کافرلار حیران قالدی چکالو

الخلخال آیدیکم بولارغه تیغ بتر اصله کار قیلمایدور هیچ نمرسه اوتمايدور
 حضرت پادشاهغه قایداف قیلسه تیغ لوتار هوکشی شونی آنکلاب بیر
 گودیک بولسه بویی نینگنی آلتون بیرای دیب وعده لار قیلدی شول وقت
 ده کافرلار ایچیده اوجاتلیق برکمپیر بار ایردی آیدیکه مونک ایشینی
 من قیلورمن دیب حیللار بیلله اسلام لشکرکا اوزینی آلدی. نچه کون
 چیریک ایچیدا یوررب حضرت پادشاه ننگ بورچی خانه لاریده خدمت
 دا یوررب مونگدین هیچ کشی خبردار بولمادی برکونی عزاتدین یانیب
 اولتوررب ایدیلار بز نچده چک ننگ واقعه سیني بیان قیلیب حضرت
 پادشاه نی تعریف و توفیق قیلیب سوال قیلدی آیدیکه ای پادشاه
 عالم پناه حضرتلارکا تیغ تبر کار قیلمایدور نه واقعه دور دیدی حضرت سید
 علي ارسلان خان پادشاه غازی خوشوقت لیک لاریده آیدیلار کیم منکا هیچ
 وقت دا تیغ تبر اوتماس مگر نمازغه تورغانده بولمیدیم سو بولور شول محل
 ده یگان برله بولمسه هم کیمسار دیدیلار بو جادو قیده سوز نیده واقعه بولوب
 دور خبردار بولوب یورور ایردی حضرت پادشاه ننگ گوهز نثار لاریدین
 بو سوزنی ایشنتی آننگدین هیچ کشی ننگ خبر بولمادی بو دله لشکر
 اراسیدین چقیب جگالو الخخال ماچین غه خوش خبر آیتتی بو کافر
 خوشوقت بولوب بو دله گا زر زیور بسیار بیردی × × ×

EXTRACT XVI.

بیر کون نماز نامداغه اذان او قودیلار مسلمانلار جمع بولوب صف صف
 بولوب یوردیلار سنت نی ادا قیلیب فرض کله تکبیر ایتتی لار نماز غه
 توردی لار ملا امام ننگ کونگلیده سوره اِنَّا اعْطَيْنَا اِبرِدي اغزلاریغه اِنَّا
 فَتَحْنَا کِلْدی کافرلار خبردار بولوب وقت نی غنیمت بیلیم صف در
 ف کریب مسلمانلار نی شهادت کا یتکوز دیلار وَكَفَى بِاللّٰهِ شَهِيدًا مُحَمَّدٌ
 رَسُولُ اللّٰهِ آیت اوشبو یرکا یتکاندا حضرت پادشاه ننگ مبارک باشلاریغه
 شمشیر سالدی مبارک باشلاری تن لاریدین جدا بولدی حضرت پادشاه
 ننگ مبارک باشلایدین آواز کیلدی کم خوشمو بیغم ملا ایکن دوک لار دیدیلار
 ذات اسم شریف لاری ملا علم ایکن دوک لار خواجه بیغم آت لقب
 بولدی ×

EXTRACT XVII.

کافرلار اهل بیت لاریکا آت سالدیلار بولار توختاب توروب جنگ قیلدیلار
 نچند کافرلار نے دوزخقه سپاریش قیلدیلار کافرلار غلبه قیلب اخر بولار نے
 شهید قیلدیلار آندین کین نچند قیزلار بیلہ بوبی چه مریم خانیم آه
 دردناک تارتیب جنگ کا کیردیلار یکرمه بش کافرني جهنم کا ایباردیلار
 کافرلار غلبه قیلیب کیلدی یرکا قرالدهلار بیر یاریلدی شول ساعت یرکا
 کریب غایب بولدیلار آندین قیزلارني شهید قیلدیلار × × ×

EXTRACT XVIII.

حضرت حسن بغرا خان غازی حضرت ایسن بغرا خان غازی
 حضرت یوسف قادیر خان غازی بو پادشاهلار میدانغه کردیلار کافرلارني
 قریب خون جیگون آتقیب پاره پاره قیلیب مال اموال لارني آلدیلار
 جو قته رشید نکتہ رشید چکالوا خلخال ماچین اون ایکی منک لشکر بیلان
 قاجیب کیتدی آرقه سیدین قرغلاب کوکیار دیگاندا ینتی لار اندا یتي کیچه
 گوندز جنگ قیلدیلار نچند مسلمانلار شهید بولدی اینهمه جنگ
 قیلیب راست کیلمادی حضرت سلطان ننگ بر اوغلانلاری عثمان بغرا خان
 غازی آمیش کشي لاری بیلان شهادت تاپتي لار کافرلار جنگ قیلا قیلا
 چین شهریکا قاجیب کیتدی ×

EXTRACT XIX.

حضرت یوسف قدیر خان غازی حضرت حسن بغرا خان غازی
 یارکند شهریکا کیلیب توشتلار خلق ني ایمانغه دلالت قیلدیلار بزرک زبان
 مسلمان بولدیلار ایمان کیلتوردیلار خلق پل مالینی جان تن لارني
 نثار قیلدیلار همه سیني فقرالارغه بیردیلار بو خلق ننگ حقیقا دعای
 خیر قیلدیلار جمعی مسلمانلار آمین دیدیلار بو مسلمانلار ننگ حقیقا
 دعا اجابت بولدی بو دعا ننگ برکاتیدین یارکند شهر هرکیز
 خراب بولماس دیب دورلار ×

EXTRACT XX.

آندین حضرت سید علی ارسلان خان غازي پادشاه شهید بولغان یوگا
 کیلدیلار × × × حضرت سلطان حسن بغرا خان غازي باشلارینی یلانک
 قیلیب کوزلارینی کوکا تیکیب قول آچیب دعا قیلدیلار مسلمانلار آمین
 دیدیلار هنوز دعالاری تمام بولماب ایردیکیم برقرانغوبوران پیدا بولدی آسمان
 نے پیر پیرنے آسمان قیلغاندیک بولدی بر ساعت دین کین بوران فست
 بولدی جهان یارغلوق بولدی باقسلار شهیدلار ننگ اوستونیکا قوم تو
 شوبدور کافراز ننگ اوستونیکا شور نوشوبدور اول باعث دین قوم
 شهیدان آت قویدیلار × × ×

آندین کین قوپوپ خیمیع لاولشکرلاری بیلان کاشقرغه روان بولدیلار
 بارب تخت کالاریدا اولتور دیلار تمام کاشقر خلقي زار زار چون ابرنو بهار
 یغلاب ماتم توتتیلار ×

راوی انداغ کیلقوروب دورلار کیم تاریخقه تور تپوز سکسن توقوز ایردی
 عشور آی ننگ اونی کرنی حضرت سید علی ارسلان خان غازي پادشاه
 شریعت شهادت نوش قیلیب شرابا ظهور ایتیب شهید بولدیلار × ×

EXTRACT XXI.

راوی انداغ روایت قیلیب دورلار کیم حضرت سلطان حسن بغرا خان
 غازي و حضرت ایسن بغرا خان غازي و حسین بغرا خان غازي و حضرت
 یوسف قادیر خان غازي بو پادشاهلار اون ایک ییل تخت خلافت دا التور
 دیلار اولاننگ وقت لاریدا دستار کیمکان کشی نی کورسلار یا خبر آلسلار
 باشیغه تمور میخ قاتار ایردیلار شوندهاغ معمورلوق بولدی کم جازک اش
 لیقنے بر پلغه آلمادیلار × × ×

EXTRACT XXII.

بو پادشاهلار تخت تجملدده اولتوروب ایردیلار یوز کشی اوچ سرداری
 بیلان تورکستان دین ایلمچی کیلیب دور دیب مولانا سعید کاشقریغه خبر
 بیردیلار حضرت پادشاه کیرسون دیدیلار خواجه عبدالله ترکستانی و خواجه
 ابو بکر تاشکندی کریم نچند یرده زمین بوسه قیلیب توردیلار حضرت

پادشاهه‌لار هارمانگلار آچمانگلار نحالینک‌لار بار ریاضت و مشقت تار
تینگزلار دیب سوال قیلیدیلار اولار هم تعظیم قیلیدیلار کیم ای پاشاه
عالم‌پناه ترکستان ولایتی کفار بولدی حضرت لاریدین شفاعت تیلاب
کیلدرک دیب عرض قیلیدیلار × × ×

بو پادشاهلار و امرا لاری حد بی قیاس لشکر یغیب ترکستان ولایتیغه
اطلاندیلار × × ×

ترکستانغه یتیب ایردی‌لار چونک کچیک همه خلق اوزبچه کلیب
اطاعت قیلیدیلار حضرت پادشاه ننگ درگاه‌لاریغه یغیلیدیلار آندین حضرت
سلطان خواجه احمد یاسوی پادشاه ننگ مزارتاریغه طواف قیلیدیلار
آب آتش قیلیدیلار لشکرگا بیردی‌لار ختم قران قیلیدیلار ثوابینی ارواح شهدا
لاریغه باغیشلاندیلار × × × حضرت پادشاه شول یاری قشعی پله توروب
ترکساننی تاشکندنی تمام مسخر قیلیدیلار سونق قی یلی ینه اطلاندیلار × × ×
شهر موشر قبیله به قبیله یوروب فدرلاری ننگ قلع لارینی خالیپ یورگان
بولاریدا یوروب توشکان یرلاریده توشوب کفاری فتح قیلیدیلار دریای عماندین
دریای قازوم تا قوردوم غچه بولار ننگ شمشیرلاری ننگ شعله‌سیدین اسلام
منور بولدی راهی شریعت کشاده بولدی دین اسلام ملت احمد برقرار
بولدی بوقت غچه نچندیل اوتتی ایمدی کاشقر زمین غه یانالی دیب
مصلحت دا ایردی‌لار کاشقر زمین غرق کافرستان لیق ایمش دیب خبر
کیلدی شول ساعت لشکر جمع بولسون دیب منادی در منادی قیلیدیلار
لشکر جمع بولدی‌لار ×

حضرت سلطان حسن بغرا خان غازی حضرت یوسف قادیر خان
غازی پادشاه غه آیدیلار کیم پییز مداین غه بارینگ حضرت امام لاریغه
عرض قیلینک کاشقر زمین کافرستان لیق ایمش حضرت لاریدین مدد تیلاب
دور میز دیب عرض قیلینک دیدیلار ×

حضرت یوسف قادیر خان غازی پادشاه مداینغه یوردیلار حضرت حسن
بغرا خان غازی پادشاه یتمش منک کشی بران کیلیب کاشقر شهرینی
قورشاب توشتی لاری اینه‌مه کافرلارنه قریب خون جیحون آقتتی لاری مسلمانلار
ظنر تابتی لاری کاشقر خلقی نے کافرلار اوز دینیغه کیرکوزوب ایت ایشاک

تونگوز گوستي ني ييب حرام حريش ني مباح بيليب مطلق کانر
بولوب قاليب ایکن - - - کانرلار طرفیدین جوقته رشید میدانغه کردی
مسلمانلار طرفیدین حضرت ایسن بوغرا خان غازی پادشاه میدانغه
کریب بهادرلوق کورکوزوب نام نصب لارینی اعیان ز بیان قیلیب جنگ گه
کیردیلر انداغ جنگ قیلدیلر کیم صفت کا راست کلماس x

EXTRACT XXIII.

القصة انداغ روایت قیلورلار کیم بو تورت اماملار مداین ده ایردیلار
اوچ آی چایلق آوغه چقیب ایردیلار حضرت یوسف قادیر خان غازی
پیش گاه دا توروب قیام کیلتوروب عرض قیلدیلار کیم ای اولان رسول الله
بیز کاشقر زمین دین کیلورمیز کاشقر زمین به تمام کفار بولدی سیزلار
دیک اولان رسول الله نذک وقتیدا فتح تابماسه موندین کین فتح بولماس
رخصت غازی بولسه بر نیچه لشکر اسلام همراه بولور میکین انشاء الله
تعالی خدای تعالی نذک عنایتی بولسه فتح قیلیب حضرت لار نذک درگاه
لاریغه کیلکایمز دیدیلار حضرت امام ناصرالدین آیدیلار ای اموالار حضرت
یوسف قادیر خان غازی پادشاه بیله تیز تند لشکر جمع قیلیب هارینگلار
اگر عاجز کیلسانگلار بیزلرکا نامه ایبارینگلار دیب یارلیغ قیلدیلار x x x

EXTRACT XXIV.

حضرت حسن بغرا خان غازی پادشاه یارلیغ قیلدیلار کیم لشکر جمع
بولسون کانرلارغه ایمان بیرگولوک ایماس دینب اوچ کونده لشکر جمع
بولدی تمام لشکر غازی آلب ینگه حصار بموضع یغه هاریب توشتیلار باشی
آلتونلوق ایاغی اورفنگ قراغچه کانرلار توشوب یاتیب ایردی نچند
کون جنگ قیلدیلار جنگ قیلا قیلا تاغ قیرغاقیغه یئتدی لار x x x اول محله
تاغ ایچیدین نچند یوز کانرلار چقیب مسلمانلارنی شهید قیلا باشلادی اول
محله حسن بغرا خان غازی پادشاه اغزلاریدین کوفوک پیدا بولوب مست
تیوه دیک بورقوراب جنگ سخت قیلدیلار خون جیحون آققیب یورروب
قضای آسمانی برله بولارغه نچند پردا اوق تیگیب شهادت تاپدیلار x

EXTRACT XXV.

حضرت حسن بغرا خان غازي پادشاه ميدانغه كيليب بيطاقت
بولوب نعره جگر بند تارتيب اوزلاريني اورديلار كافرلاردين خون جيحون
آقتيلار حضرت پادشاهغه نچند یرده اوق تيگدي قان سیراب یقيلديلار نکته
رشيد حضرت پادشاه ننگ مبارک باشلاريني تن لاريدين جدا قيلدي X
حضرت حسن بغرا خان غازي شهادت تاپقاندین کين كافرلار تمام مسلمانلار
ني شهادت کا يتکوزديلار گویا قیامت قائم بولدي ياروق جهان قرانغولوق
بولدي X X X

EXTRACT XXVI.

حضرت يوسف قادير خان مداین دا ایردیلار . . . مداین دین یوسف
قادیر خان غازي یوز منگ لشکر بیلان کیلادورمیش دیب جوخته رشید
تمام لشکری بران قاجیب چین شهریکا کیئدی کاشقر خلقي قحفه های
هدیه لار آلیب حضرت یوسف قادیر خان غازي ننگ الدیلارغه اندیجان
تاغیغه باردیلار اوزانگولارغه کوزلاریکا مورنوب پشت پای لاریغه سونیدیلار XXXX

EXTRACT XXVII.

یفه روایت دا کلتوروب دورلار کیم حضرت یوسف قادیر خان غازي
پادشاه قوق منگ لشکری آلیب دادام ننگ انتقامینه آسام دیب
ختن قباب یگره نورت یل اوروشوب ختن یورتینی آلیب جگالو الخخال
ماچین لے اولتوروب داداسی ننگ انتقامینه آلیب ختن ننگ مال
اموالینی آلیب کیلیب خان ارقی ننگ برقاشینی تازغون ننگ
یتی کنت نے چارک لیک یورنه بر منقال آلتونغه آلیب رقف اوقاف
قیلدي X X

کاشقرغه یاندیلار یوقارغی یول برله قزیل دیگان یرکا توشتیلار حضرت
سلطان سید ارسلان خان غازي پادشاه ننگ حق لاریده لنگر بنا قیلغودیک
ییرایکان برکول چانگولار دیب امری قیلدیلار ارشول ساعت کول
چاققالي مقید بولدیلار اوق بشاقیده بوشاتیب آدم باشیغه بر مژشت دین
تفرای آلیب بر کونده کول فوتکان دیب دورلار XXX

EXTRACT XXVIII.

حضرت امام لار نامه نے کوروب آیدیلار کیم ای یارانلار بیزکا کاشقر زمین
 دین نامه کیلیدی بیز از برای فتح کفار اوچوق بارادورمیز بیز نذک مونددین
 اوزکا ایشیدیز یوق تورور دیب × × × بطرف کاشقر زمین روان بولدیلار ×
 × × پخند کوندین کین حضرت امام لار حضرت یوسف قادیر خان
 غازی نے کاشقر ولایتیغه پادشاه قیلیب بطرف ماچین روانه بولدیلار
 کیلیب شهر نذک آلدیغه توشتیلار کافرلار بو لشکرکا حیران قالدیلار شول
 وقتدا چوقته رشید نذک بر سحرگری یار ایردی آیدیکیم ای پادشاهم
 نیمه مونجه بی طاقت بولورسینلار شهر نے کورسه آلورمو کورمسه هم آلور
 مو دیدی چوقته رشید آیدی ای وزیر بونه سوز دور شهر کورنوب تورور
 متولدغ دیکور دیدی ساحر دیدی شول لشکر نجه کون موندی توره
 من شهر نے میاشورای دیدی چوقته رشید تعظیم قیلیب اولتوردی همه
 کافرلار خوشحال بولوب طبل شادیانه چالدیلار تانک آتیه حضرت امام
 لار نماز دین فارغ بولوب × × × بر کشی نے بو روز دیلار کریم ایتغیل
 بو کیلکان کشی حضرت محمد مصطفی صلی الله علیه وسلم نذک اولاد
 لاری تورلار مبارک اسم لاری حضرت امام ناصرالدین و امام معین الدین
 و امام ظهور الدین و امام قوام الدین تورلار بو ماروا الزهر دین کاشقر زمین
 نے فتح قیلماق اوچون یوز قرق مینگ لشکر بیلان کیلدیلار مغه بوپور
 دیلار کیم نین کریم اول کافرلارغه ایتقیل ساغداق لارینی بوپورلارغه
 آسیب نذک الدیمغه کیلیب مسلمان بولوب ایمان کیلتورسونلار اگر
 ایمان کیلتورمسه لار چوقته رشید باشلیغن همه کافرلار نے اولتوروب بالا
 لایینی اسیر قیلیب شهرلارینی ویران قیلادور دیدی بو سوزنی ایشتب
 کافرلارغه یاروق جهان قرانغو بولدی کافرلار اندیشه قیلیب ایدی دینمز
 دین یانماس میز دیدی بر یاشیل چادیر اورداغه تیکدیلار شمعان باشلیغ
 قرق بر ساحر سحرغه مقید بولدی × × × جنگ قیلغالی راست بولدیلار
 شهر غایب بولدی بیلدیلار کیم سحرگر سحر قیلغاندور دیدیلار × × × تانک
 آتیه شهرینه آشکارا بولدی طبل جنگ چالدیلار شجاعت لیک یگیتلار

جنگ کا آت سالیش لاری همان شهر ینہ غایب بولدی شبو طریقہ برله
مدتی قرق یل چین شهری نذک ایچیدا قرار تابتیلار عاقبت الامر چوقته
رشید بتمام لشکری برله برکیچه قاجیب کیلتی × × ×

EXTRACT XXIX.

حضرت اماملار چوقته رشید نکتہ رشید ننگ ارقہ سیدین قوغلاق روانہ
بولدیلار × × × حضرت اماملار نمازہ ایردیلار کافرلار وقت نے غنیمت
تاقیب حضرت اماملار نے وقت سجده دا قویدیلک بوغوزلادی × × ×
اندین کین توغنے آلاي دیب این همه جنگ قیلدیلار توغچی ننگ
قولینہ کیستی توغنے بیرمای تیزلاریغہ آلیب توتیلر تیزلارینہ هم کیستہ
لار بوینلاریغہ کیستی بوینلارینہ کیستہ توغ هواغہ اوروب غایب بولدی
کون توتولدی جهان قرانغولوق بولدی آسمانلارین آواز کیلدی ییردین
غریبی چیقته کافرلار بطرفه ماچین کا کیتدی × × × برکشی قاجیب
کاشقرغہ باریب حضرت یوسف قادیر خان غازي پادشاه غه خبر قیلدی
یوسف قادیر خان پادشاه غازي شول زمان آطلاندیلار کیچکله کوندوز
لاب کیلیب کوردیلار گیم حضرت اماملار ننگ مبارک باشلارینہ تن لاریدین
جدا کوروب بیهوش بولدیلار ینہ هوش لاریغہ کیلدیلار × × × کوردیلار کیم آدم
ننگ اولوکی سای ننگ تاشي دیک یا تادور معلوم بولمایدور کافرمو
مسلمانمو دیب هوان قالدیلار × × × مناجات قیلدیلار شول ساعت بر
صاعقه پیدا بولوب تاغ لاریدین سو قوبولدی اسماندین یغور یاغدی مسلمانلار
ننگ پوزینہ قبله غه قیلیب قویدی کافرلار ننگ تنیني یوز توبان سالدی
کافرلار ننگ باشینہ آقتیب کیتدی آندین کین حضرت اماملار ننگ
مبارک جسدلاریني صندق ایچیکا آلیب قویدلار اوزکا مسلمانلار ننگ تنیني
دفن قیلدیلار × × × تاریخقه بش یوز توقسان آلتی ایردی ذی الحجّه آی
ننگ اوني دوشنبه کوني حضرت اماملار شربت شهادت نوش قیلدیلار—
والله اعلم بالصواب



Fig 1



W King del

*Burial Places with Cruciform Monoliths near Mungapet
in the Nizam's Dominions*

J Schaumburg del



ROUGH SKETCH OF A SCULPTURED SLAB OR PILLAR AT MAUZA' NIKĀMAU, PARGANAH MAHOBA.

Vincent A. Smith del



TWO SEALS OR AMULETS FOUND AT BARENĀ THE SITE OF BHARK VILLAGE
IN PARGANAH JALAJPŪR, HAMIRPUR DISTRICT

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Part I.—HISTORY, LITERATURE, &c.

No. IV.—1877.

Pali Studies. No. 2.—By Major G. E. FRYER, Deputy Commissioner, British Burma.

II.—THE PĀLI TEXT OF THE VUTTODAYA, OR 'EXPOSITION OF METRE',
BY SAṄGHARAKKHITA THERA, WITH TRANSLATION AND NOTES.

Introduction.

The Vuttodaya ('Exposition of Metre') is the second metrical treatise written in Ceylon during the twelfth century by the Pāli grammarian Moggallāna, under his priestly title of Saṅgharakkhita Thera. It is the only work on Pāli prosody extant, and is founded on the *Vṛttaratnākara* (Ocean of Metres), a Sanskrit work on post-vedic metres by Keṭāra Bhaṭṭa. It contains 136 stanzas or portions of stanzas, divided into six chapters which treat of the following subjects :

Chap. I.—The technical terms, and symbols in prosody.

Chap. II.—Metres regulated by time.

Chap. III.—Metres with quarter verses similar.

Chap. IV.—Metres with half lines similar.

Chap. V.—Metres with quarter verses dissimilar.

Chap. VI.—The six problems.

The work opens with the usual adoration to Buddha. Then follow an explanation of the technical terms, and a description of the various metres in Pāli prosody. In the second, third, fourth, and fifth chapters, each variety is illustrated in its own metre. The sixth chapter enunciates the

six problems, and the work closes with a tribute of regard to the author's instructor, Sīla Thera.

The text has been collated from several Burmese MSS. and compared with two other valuable copies, one, a transcript from a Singhalese MS. in the India Office, kindly presented to me in 1870 by the late Professor Childers; the other, a tract, derived from two Singhalese MSS. by Professor Joh. Minayeff, published in 1869 by the Imperial Academy of Sciences of St. Petersburg. Mr. Childers' copy has 138 verses, but the last two are merely portions of postscripts to other treatises of the author. Mr. Minayeff's text from wrong numbering has only 119 verses, though the matter forms 136. In this sketch C stands for the first of these, and M for the second.

There are several Pāli commentaries on *Vuttodaya*, and glosses on the commentaries. It is believed, the following comprise all that are to be met with in Burma.

- | | |
|-----------------------------|---|
| 1. <i>Vuttodaya Tīkā,</i> | by Nava Vimalabuddhi at Pagan during the reign of the Burman king Kyatswá, circa 1212 A. D. |
| 2. <i>Chandosárattha,</i> | by Sadhamma ñāna at Pagan during the same period. |
| 3. „ <i>Tīkā,</i> | by the same author. |
| 4. <i>Cha-ppaccaya,</i> | by the same author. |
| 5. <i>Vacanatthajatiká,</i> | by Vepulla at Pagan during the same period. |
| 6. „ <i>Tīká,</i> | by the same author. |
| 7. <i>Kavísāra,</i> | by Dhammananda at Pegu during the reign of the Pegu monarch Dhammarájádhirāja, circa 1385—1421, A. D. |
| 8. <i>Tīká,</i> | by Buddhadbáta during the same period. |

Of these, the three principal commentaries, viz., the second, fifth, and seventh have been consulted, and are referred to under the abbreviations of *Chando.*, *Vac.*, and *Kav.*

My grateful acknowledgements must here be made to the subjoined works from which I have derived great assistance; C. P. Brown's *Sanskrit Prosody Explained*; Weber's *Ind. Stud.*, Vol. VIII; Colebrooke's *Life and Essays*, Vol. III; and the translation of the *Vrittaraṭnākara* now passing through the pages of the *Pandit* at Benares.

A table of the prosodial feet is given at page 391, they are denoted in these pages by the initial letter of their symbols in capitals. A single long syllable is marked G, a spondee Gú; a breve is marked L, a pyrrhic Lá.

TEXT.

NAMO TASSA BHAGAVATO ARAHATO SAMMA'SAMBUDDHASSA.

1. nam' atthu janasantānatamasantānabhedino,
dhamm' ujjalantarucino, munī¹odāgarucino.
 2. Piṅgalācariyādihi chandaṃ yam' uditam purā
suddhamāgadhikānan tam na sādheti yat' icchitam,²
 3. tato Māgadhahāsāya, mattāvanna vibhedanam,
lakkhyalakkhaṇasamyuttam,³ pasannatthapadakkaman,
 4. idaṃ Vuttodayaṃ nāma, lokiyacchandaniṣṣitam,
ārabhissām' ahaṃ 'dāni⁴ tesam sukhavibuddhiyā.
-
5. sabba-gla mn', ādi-⁵ga-lahu bhyā, majjhanta garū⁶ ja sā.
majjhanta-la ra t', etc 'ttha' gaṇā; go garu, lo lahu.
 6. bha-ja-sā sabbaga-lahu pañc' ime, saṇṭhitā gaṇā
ariyādimhi viññeyyā: gaṇo idha catukkalo.
 7. samyogādi ca, dīgho ca, niggahitaparo ca, yo.
garu vaṅko pādanto⁷ vā; rass' añño⁸ mattiko l' uju.
 8. pare pādādi-samyoge, yo pubbo garuk' akkharo,⁹
lahu sa kvaci viññeyyo; tad udāharanāṃ yathā:—
"dassanarasānubhavano" || nibaddhagelhi jinass' ayaṃ janatā.
"vinhayajanani saññata-|| kriyā nu kan nānurañjayate."
 9. viññeyyā, lokato; saññā sammuddosurasālināṃ;
pādo ñeyyo catutthamso; padacchedo yati bhhave.¹⁰

¹ chanda' yam, C.² yath' icchitam, C; yad icchitam, M.³ lakkha, C.⁴ ārabhissam ahan dāni, C and M.⁵ ma n' ādi, C: m-nā 'digulahu, M.⁶ guru every where for garu in C.⁷ ra te-t' attha, C; rat' et' attha, M.⁸ padanto, C. and M.⁹ russo 'ñño, C.¹⁰ guru-v-akkharo, C.¹¹ rasānubhavane, M.¹² yati bhavo, M.

10. samam adḍhasamam¹ vuttam, visamañ cāparam tidhā.
samā lakkhaṇato pādā cattāro yassa, tam samam.
11. yass' antimenā dutiyo tatiyen' ādimō samo
tad adḍhasamam ;² aññan tu bhinnalakkhaṇapādīkam.
12. pādam ekakkharārabbha, yāva chabbisatakharā,
bhavē pādēhi tam chandam nānānāmoditam tato.
13. daṇḍakācaṇḍavutṭhyādi, pādēhi chahi, tīhi tu,
'gāthā 'ti ca, paratth' evam chandosaññapakūsitā.
14. anantaroditam, c' aññam etam, sāmāññanāmato³
'gāthā 'icc eva,⁴ niddittham,⁵ munindavacane pana.
15. visesanāmato, kiñci gaḥetvā sabbathocitam⁶
dassayissām' ahan,⁷ t'ettha nāmān' āvibhāvissare.⁸
iti Vuttodaye chandasi saññā paribhāsūniddeso nāma paṭhamo paricchedo.

16. chattho 'khilalahu jo vā ga-yutā, 'ññe chaggaṇā na jo visame ;
ariyā y antaḍḍhe' lo chattho 'nte gaṇā ceh' aññe.
17. paṭhamadḍhe chattho ce sabbalah 'etth' ādilahunī⁹ bhavati yati
tapparako¹⁰ nte pi saḍe carime pi bhavati catuttho 'nte.
18. ariyāsamaññañ ce pubboditalakkhaṇam bhavē yassā.
19. ādimam atha pādayugam yassā tyamschi sā pathyā.
20. yattha gaṇattayam, ullanghiyobhayatth' ādimō bhavē vipulā.
21. garumajjhako jakāro catutthako dutiyako capalā.
22. capalāgatākhilāñ ce dalūdimam lakkhaṇam bhajati yassā
pathyā-lakkhaṇam aññam mukha-capalā nāma sū bhavati.
23. pathyāyā¹¹ lakkhaṇāñ ce paṭhamadḍhe lakkhaṇan tu capalāyam.¹²
dutiye dale 'tha yassā pakittitā sū jaghana-capalā.

Ariyājātiyo.

24. sabbam paṭhamadale yadi¹³ lakkhaṇam ariyāya vuttam ubhayesu
yassā dalesu yuttam vuttā sū gīti vutta yati lalitā.

¹ addhasamam, C.

² gāthā-m-icceva, C.

³ nidditthā, C. and M.

⁴ sabbato 'citam, C.

⁵ aham, M.

⁶ āvibhāvissare, C and M.

⁷ ariyā anta, C and M. addho tor adḍho everywhere in C.

⁸ sabbalahetvādi, C.

⁹ pathyā, C.

¹⁰ capalāya, M.

¹¹ yadi wanting in M.

25. ariyāyaṃ dutiyaḍḍhe gaditākhilakkhaṇaṃ yantaṃ
bhavati dales' ubhayesu pi yadi yassa sā yaṃ upagīti.
26. ariyāy 'aḍḍhadvitayaṃ' pubboditalakkhaṇopetaṃ^a
vipariyayenābhihitā yassa sambhavati cē 'ha soggīti.
27. ariyā pubbaḍḍhaṃ yadi garuṇ 'okenādhikena nidhane yuttaṃ
yadi pubbaḍḍhasamānaṃ dalam itaraṇi coditā yaṃ ariyāgīti.

Gitijātiyo.

28. visame cha siyūṃ kalā mukhe same^a ty attha ra la gā tato 'pari'
vetālīyaṃ tam uccate ; lahuchakkaṃ na nirantaraṃ same.
29. vetālīyopamaṃ mukhe taṃ opacchandasakaṃ ra yā yad ante.
30. āpātalikā kathitā 'yaṃ bha ga gā 'nte yadi pubbamiv' aññaṃ.
31. yad ādito lakkhaṇantikā^a tti^a ettha padesavākhilesu^a jo.
32. udiccavuttitiv-uccate^a jo c' ādo visamesu saṇṭhito.
33. pubbattha samesu^a cē ga jā paccavuttir uditā 'ti saṇṭhitā.^a
34. samāsama^a 'tr' ādinaṃ^a samāsanyutā bhavati taṃ pavattakaṃ.
35. assa sā¹⁰ samakatā 'parantikā.
36. tad aññajā cāruhāsini.¹¹

Vetālīyajātiyo.

37. dvikavihatavasulahu¹² acaladhiti^a iha.¹³
38. mātāsamaṃ navamo lga^a 'nte.¹⁴
39. jo nlā¹⁵ 'thavā 'ṇṇavā visiloko.¹⁶
40. tadvayato vānavāsikāhkyā.¹⁷
41. pañcattāṇavasu yadi lo citrā.

¹ dvikayam, M.

² lakkhaṇūpetam, C.

³ cha kalā siyūṃ same tāttha ra lagā tato 'pari, C.

⁴ dakkhiṇantikā, C.

⁵ padesavākhilesu, C.

⁶ vuccati, C.

⁷ pubbaḍḍhasamesu, M.

⁸ paccavuttit 'uditā 'ti, M. paccavuttir uditeti saṇṭhito, C.

⁹ ādīnam, C and M.

¹⁰ yā, C.

¹¹ cāruhāsini, C.

¹² vihatāvasulahu, M.

¹³ acaladhiti, C ; acalathiti iha, M.

¹⁴ la g 'ante, C. l g ante, M

¹⁵ na lā, C.

¹⁶ visiloko nāma, M.

¹⁷ tan ca yato vānavāsikā 'kkhyā, C.

42. ga lyá 'tṭhahi' ce sú-v-upacitrá.

43. yam atīṭalakkhaṇavisesayutta-^a
mattásamādi pādābhihitam ;
aniyatavuttaparimāṇasahitam,
paṭhitam^b janesu pādākulakam.

Mattāsamakajātiyo.

44. vinā vaṇṇehi mattá gá, viná vaṇṇá garúhi tu,
viná luhúni garavo, dale paṭhyádino, matá.
iti^c mattāvuttāniddeso dutiyo.

45. tyá ce tanumajjhá.

Gáyatti.

46. kumáralalitá jsgá.

Uṇhi.

47. citrapadá yadi bhá gá.

48. mo mó go go vijjunmálá.

49. bhá^d tá la gá māṇavakaṇi.

50. glá samāṇiká^e ṛa já ca.

51. pamāṇiká^f ja rá la gá.

Anuṭṭhubham.

52. rá^g na sú yadi halamukhí.

53. bhujagasusu matá^h ná mo.

Brahati.

54. msá jgá suddhavarāḍitamⁱ matam.

55. mná yo go yadi paṇavo 'kkyáto.^j

56. bhíná-sa-ga-yuttá runmavatí sá.

57. neyyá mattá ma-bha-sa-ga-yuttá.

¹ ga ly' atṭhahi, C.

² yutam, C.

³ paṭhitam M. wanting in C.

⁴ iti vuttodayo mattá, M.

⁵ bho, M.

⁶ ro, M.

⁷ bhatá, C and M.

⁸ suddhavarāḍitam, C; matam wanting in M.

⁹ 'kkhyáto, C; paṇavo 'kkhyáto, M.

58. campakamālā ce bha ma sá go.
 59. na-ra-ja-gchi sa manoramā.
 60. ubbhāsakan tam ce to ma rá lca.¹

Panti.

61. tjá jgá garuná 'yam upatthitá sá.²
 62. indádiká tá vajirá ja gá go.
 63. upádiká sá 'va ja-tá-ja-gá go.
 64. anantarodíritakkhaṇá ce³
 pádú vimissá upajátiyo tá
 evam kil' aññásu vimissitásu⁴
 vadanti jútisv idam eva náman.
 65. sa ja já la gá gaditá sumukhí⁵
 66. dodhakam icchati ce bha bha bhá gá.
 67. ved'assehi⁶ mtá tga gá sálini sá.
 68. vátummissá' yati sá nibhá ta gá go.
 69. bhá⁷ ta na gá go surasasirí⁸ sá.
 70. ro na rá iha¹⁰ rathoddhatá la gá.
 71. svágateti ra na bhá garuká⁹ dvp.
 72. na na ra lahu-garúhi bhaddiká.

Tuṭṭhubham.

73. vadanti vamsattham idam ja tá ja rá.
 74. sá-y-indavamsá¹¹ khalu yattha tá ja rá.
 75. idha totukam ambudhi sehi mitam.
 76. dutavilambitam áhu¹² na-bhá bha-rá.
 77. vasu-yuga-viratí ná myá puṭo 'yam.¹³
 78. na-ya-sahitá nyá kusumavicittá.

¹ ubbhāsakan tam ce to ma ra lva, C; ubbhāsakan tam ce to ma rá la, M.

² yam upatthitá, C; sá, wanting in C.

³ lakkhaṇo ce, M.

⁴ kir' aññásu pi nissitásu, C; kir', M.

⁵ sumukhí guditá, C.

⁶ vedesshi, B.

⁷ cátummi sá, C.

⁸ bho, M.

⁹ surassirí, C.

¹⁰ idha, C.

¹¹ sá indavamsá, C.

¹² áha, M.

¹³ putho 'yam, C.

79. bhujangappayātam¹ bhavē veda-yehi.
 80. na-bha-ja-ṭhehi bhavati ppiyamvadā.
 81. vuttā sudhhi lalitā ta-bhā ja-rā.
 82. pamitakkharā sa-ja-sa-seh' uditā.
 83. na-na-bha-ra-sahitā 'bhihit' ujjalā.
 84. pañc' assa-ccinnā² vessadevī ma-mā yā.
 85. bhavati³ hi tāmarasaṃ na ja-jā yo.
 86. kamalā ti ñeyyā sa-ya-sehi yo ce.⁴

Jagati.

87. mnā jṛā go ti-dasa-yati ppahāsini⁵ sā.⁶
 88. catuggaheh' iha⁶ rucirā ja-bhā sja gā.⁷

Atijagati.

89. na-na-ra-sa-lahu-gā sarehi 'parājita.
 90. ~~na-na-ra-sa-lahu-gā~~ bha-na-la-g' iti ppaharaṇakalikā.
 91. vuttā vasantatilakā ta-bha-jā⁸ ja-gā-go.

Sakkari.

92. dvihata-haya-lahu-r atha g' iti⁹ sasikalā.
 93. vasu-haya-yati-r iḍha manigūṇanikaro.¹⁰
 94. na-na-ma-ya-yā-yutā 'yāp'¹¹ mālini bhog-isīhi.
 95. bhavati na-jā bha-jā ra-sahitā pabbaddakam.

Atisakkari.

96. na-ja-bha-ja-rā yadā¹² bhavati vānini ga-yuttā.

Atthi.

97. ya-mā no so bha-lgā¹³ rasa-hara-virāmā sikhariṇi

bhujagappayā tam, G.

¹ pañcassa, C: chinnā, M.

² vadati, C.

³ yo vo, C.

ppabhāsini, C.

catuggahehi bha, C.

sa jā g, C; sa-j-gā, M.

na bha jā, C.

g'iti, C.

maniganikaro, C.

nam, M.

¹² sadā, C and M.

¹³ bha la gā, C: bho l-gā, M.

98. rasa-yug-isito no so mrá slá' gyadá hariní tadá.

99. mandakkantá² ma-bha-na-ta-ta-gá go yūg-utv-assakehi.³

Atyattḥi.⁴

100. mo to no yo⁵ yá kusumitalatávellit⁶ akkh' utv-isíhi.

Dhuti.

101. ras'-utv-asschei ymá' na-sa-ra-ra-garú meghavipphujjitá⁸ sa.

102. akk' asschi-yati msa-já⁹ sa-ta-ta-gá saddúlavikkiliti.¹⁰

Atidhuti.

103. vuttam ídisan tu námato ra-já ra-já ra-já garullahú ca.¹¹

Kati.

104. mrá bhná yo yo 'tra yena tti-muni¹²-yati-yutá saddhará kittitá 'yaṃ.

Pakati.

105. bhrána-ra-nára-ná c' atha¹³ garuddasakka-viramam¹⁴ bhaddakamidam.

A'kati.

iti samavutta paricchedo tatiyo.

106. visame yadi sá sa-la-gá same bha-ttayato garuká-r¹⁵-upacittam.

107. bha-ttayato yadi gárutamajjhá¹⁶ yadi puna-d-eva¹⁷ bhavanti najá jyá.

108. yadi sa-ttitayam garuyuttam vegavatí¹⁸ yadi bha-ttitayá gá.

¹ ma ra sa la, C.

² mandakkantá, C.

³ assagehi, M.

⁴ accattḥi, C.

⁵ mo to yo no, C.

⁶ velalitá, C.

⁷ ya má, C.

⁸ vipphujitá, C; vipphujjiká, M.

⁹ yadi ma sa ja, C.

¹⁰ saddúlavikkilitam, C; vikkilini, M.

¹¹ guru lahu ca, C; garullahuñi ca, M.

¹² ma ra bha ná yo yo ta yena n timuni, C.

¹³ ná 'tha ca, C.

¹⁴ viramam, C.

¹⁵ guruká-v, C; garugá c', M.

¹⁶ dutamajjhá, C.

¹⁷ punareva, C.

¹⁸ vogavati, C.

109. to jo visame rato garu cce¹ msá jgá bhaddavirājam ettha go ce.
 110. visame sa já sa garuyuttá ketumatí same bha ra na gá go.
 111. ákhyániká² ta visame jargá go ja tá ja gá go tu same 'tha páde.
 112. ja tá ja gá go visame same tu lá jo ga gá ce viparítapubhá.
 113. sa sato sa la gá visame same na 'bha bha ra bhavate³ harinaplutá.
 114. yadi na na ra la gá na já ja rá yadi ca⁴ tadá 'paravuttam icehati.
 115. visamam upagatá na ná ra yá ce na ja ja ra gá samake ca pubbitaggá.
drayam idam retáliyappabhedo.

116. sá yavádikámatí⁵ ra já ra játvasame samo⁶ jará jará garu bbhaveyyum.
iti adḍhasama-vuttaparicchedo catuttho.

117. n' atṭhakkharesu pádesu sn' ádimhá⁷ yo 'ṇṇava vattam.
 118. sanesu sindhuto jena pathyávaṭṭam pakittitam.
 119. ojesu jena sindhuto tam eva viparítádi.
 120. na-káro ce jaladhito capalávattam ice etam.
 121. 'same lo sattamo yassá vipulá Piṅgalassa sá.
 122. Setavaasákhilesu pi.
 123. bhen' aṇṇavá⁸ tabbipulá.
 124. evam aññá⁹ ro catuttho.
 125. no 'ṇṇavá ce na-vipulá.
 126. to 'ṇṇavá tathá 'ññá siyá.
vattappabhedo.

127. na dissat' ettha yaṃ chandam payoge dissate¹⁰ yadi.
 visamakkarapádan tam gáthá sám aññanámato.
iti visamavuttaparicchedo pañcama.

128. pattháre sabba-ge páde pubba-gá 'dho lpāre samá.
 pubbe garu te ca-m-ime¹¹ kattabbá yáva 'sabba-lá.¹²

¹ garuñ ce, C.

² ákhyatiká, C; ákhyatiká, M.

³ bhavati haritapluta, C.

⁴ yadi va, C; ca wanting, M.

⁵ yuvádikámalí, M.

⁶ rajātu 'sa me samo, M; rajá tu samo 'same, C.

⁷ sa nádinhá, C; sn'-á' dimha, M.

⁸ aṇṇava, C.

⁹ aññá, C. and M.

¹⁰ dissati, C.

¹¹ tv evam ime, C and M.

¹² lo, C and M.

129. naṭṭhassa yo bhaveyy' añko tasmin lo 'ddhikate same
visame tv ekasahite bhaveyy' addhikate ^{garu}.
130. ekādinukkamen' añke pubbā 'dho dviguṇe¹ likho
missitehi lahutthehi sekeh' uddiṭṭhakam bhave.
131. vuttakkharasamā saṅkhyā likkhyā' s'ekopar' ūpari
ekkahānam ekādin' uṭṭhāne sabbagādikam.
132. garukriyā 'ñkasandohe bhavo saṅkhyā vimissite²
uddiṭṭh' añkasamāhāro seko vemam³ samānaye.
133. saṅkhyeva dviguṇekūnā vitthārāyāmasambhavā⁴
vuttass' addhāntarānañ ca garu-lānañ ca aṅgulaṃ.
*iti Sangharakkhitatherapādaviracite Vuttodaye chandasi chappaccayavi-
bhāgo nāma chaṭṭho paricchedo.*⁵
134. sclantarāyatana⁶vāsikaSīlatherappādo⁷ garugguṇagurujjayatam' nam
yassappabhavamavalambanay' edisopi⁸ sampādito 'bhimatasiddhikaro
135. paratthasampādanato puññenādhigaten' ahaṇi [parattho.
paratthasampādanako bhaveyyam jātijātiyam.
136. avalokitamattena yathā chappaccayā mayā
sūdhitā sādhiyante⁹vam⁹ iccchitattam pi pāpino.

Vuttodayapakaraṇam niṭṭhitam.

¹ likhyā, C.

² vinissate, C.

³ dve 'mam, C.

⁴ sambhavo, C; yāvasambhavo, M.

⁵ iti — paricchedo omitted, C.

⁶ therapādo, C; therāpādo, M.

⁷ garūguṇa garūjjayatam, M; guruguṇaguru jayatam, C.

⁸ mamedisopi, M.

⁹ sādhiyante⁹vam, C; sādhiyante⁹na m', M.

End of Text.

TRANSLATION.

1. Praise be to the Chief of Sages, beautifully pure, radiant with the glory of virtue, who dispels the universal ignorance of mankind.
 2. The formerly written prosodies of Piṅgala and others, are not suited to the Māgadha people.
 3. Therefore, distinguishing verses measured by feet from those regulated by time, together with the distinctive peculiarities of each, (made into) an understood series of poetry,
 4. This Vuttodaya, a collection of secular prosody, I will now commence in the language of the Māgadha people for their instruction.
-
5. (That foot is called) *ma*, (the three syllables of which are) all long; (that is) *na*, (the three syllables of which are) all short; *bha*, has the first long; *ya*, the first short; *ja*, the middle long; *sa*, the last long; *ra*, the middle short; *ta* the last short. These are the eight feet; *go* (stands for) *garu* (heavy); *lo* (for) *lahu* (light).
 6. Be it known that the five feet, *bha*, *ja*, *sa*, *ma*, *na*, are used in the Ariyā and other metres of that class. In that class a foot consists of four syllabic instants (*kāla*).
 7. A vowel preceding compound consonants, a long vowel preceding the *niggahīta*, and optionally a vowel at the end of a quarter verse are heavy, and indicated by a bent mark; the other, a short vowel, measuring an instant of time, is light, and indicated by a straight mark.
 8. Be it known, that a heavy vowel—preceding compound consonants at the beginning of a quarter verse—is sometimes light, as in the subjoined illustration :

ḍassanaraśanubhavane nibaddhagedha jīṇass' ayam janatā
 sīhahayajanani saññata kriyā nu kan nanurañjayate.
 9. Be it known, that the terms *samuddo*, *usu*, *rasa* and the like, are used in the popular sense; *pāda* is the fourth part of a verse; *yati* is verse division.
 10. Metre is threefold, either *sama*, *addhasama* or *visama*. That is *sama*, the quarters of which are similar in character.
 11. That is *addhasama*, which has its first and third, and second and fourth respectively alike. That is *visama*, which has quarters dissimilar in character.
 12. Metres vary in length from one up to twenty-six syllables in a quarter verse.
 13. Chants such as the *Daṇḍaka*, *Caṇḍavutṭhi* and the like, and metres having three or even six *pādas* are called 'Gāthā' in another work.

14. Further, in Pāli, other kinds of metre, as well as those just spoken of, are comprehended under the general name of Gāthā.
15. I will now point out the characteristics of the metres generally used, the names of which are noted herein.

(Here ends) the first chapter giving the general definitions and symbols in prosody.

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16. When (in the first half of a stanza) the sixth foot is an amphibrach (J), or a proceleusmatic (NL), and with no amphibrach (J) in the odd feet of the remaining six, together with a final long (G); and when in the second half, the sixth foot is a breve (L) with six other feet, together with a final long quantity (G), the metre is called Ariyā.
 17. If the sixth foot of the first half be a proceleusmatic (NL), the pause must be on the first of the four instants; if in the second half, the fifth foot be a proceleusmatic (NL), the pause falls on the last syllable of the fourth foot.
 18. A metre possessing the aforesaid characteristics is comprehended under the general name of Ariyā.
 19. If the initial *pādas* of each half verse are restricted by the pause to three feet (*i. e.*, twelve instants), the metre is Pathyā.
 20. If the initial *pādas* exceed three feet, the metre is Vipulā.
 21. That is Capalā, in both halves of which the second and fourth foot is an amphibrach (J).
 22. That is Mukhacapalā, the first half of which has the characteristics of a Capalā, and the second half those of a Pathyā.
 23. That is Jaghanacapalā, the first half of which has the characteristics of a Pathyā, and the second half those of a Capalā.
- (Here ends the section on) the Ariyā class of metres.*
24. That is Gīti, in which both halves have the characteristics of the first half of the Ariyā, with the pause appropriately placed.
 25. That is Upagīti, both halves of which have the characteristics of the second half of the Ariyā.
 26. That is Uggīti, which exhibits the halves of an Ariyā stanza in inverted order.
 27. That is Ariyāgīti, the halves of which correspond respectively with the first half of the Ariyā plus one long syllable at the end.
- (Here ends the section on) the Gīti class of metres.*
28. That is Vetāliya, which has six instants in its odd quarters, and eight instants in the even, followed in each quarter by a cretic (R), and iambic (LG); in the even quarters six breves should not follow consecutively.

29. That is Opacchandasaka, which has a cretic (R), and a bacchic (Y), following the six instants in the odd, and the eight instants in the even quarters.
30. That is Apātalikā, which has a dactyl (B), and a spondee (Gá) following the six instants in the odd, and the eight in the even quarters.
31. That is Lakkhanantikā, in the quarters of which an amphibrach (J) constitutes the first four instants.
32. That is Udiccavutti, in the odd quarters of which an amphibrach (J) constitutes the first four instants.
33. That is Paccavutti, in the even quarters of which a long syllable and an amphibrach (GJ) form the first six instants.
34. That is Pavattaka, the odd quarters of which correspond with those of Udiccavutti, and the even with those of Paccavutti.
35. That is Aparantikā, the quarters of which correspond with the even quarters of Pavattaka.
36. That is Cāruhāsini, the quarters of which correspond with the odd quarters of Pavattaka.

(Here ends the section on) the *Velāliya* class of metres.

37. That is Acaladhiti, the quarters of which consist of sixteen instants.
38. That is Mattāsamaka, in the quarters of which the ninth instant is a short syllable, and the two last instants a long syllable.
39. That is Visiloka, which has in each quarter after the fourth instant, either an amphibrach (J) or a proceleusmatic (NL).
40. That is Vānavāsikā, which has in each quarter after the eighth instant, either an amphibrach (J) or a proceleusmatic (NL).
41. That is Citrā, the fifth, eighth, and ninth instants of which are breves.
42. That is Upacitrā, which has a dactyl (B), and a spondee (Gá), after the eighth instant.
43. That is Pādākulaka, the quarters of which though consistent with the principle of the Mattāsamaka class, contain syllables of mixed quantities.

(Here ends the section on) the *Mattāsamaka* class of metres.

44. Be it known, that in the Pathyā class of metres the difference between the number of the long quantities, and the instants, equals the number of the syllables; the difference between the number of the syllables and the instants, equals the number of the long quantities; half the difference between the number of the short quantities and the instants equals the number of the long quantities.

(Here ends) the second (chapter) describing the metres regulated by time.

In the Gáyatti.

45. That is Tanumajjhá, the quarters of which consist of an antibacchie (T), and a bacchie (Y).

In the Uṇhi.

46. That is Kumáralalitá, the quarters of which consist of an amphibrach (J), an anapæst (S), and a long syllable (G).

In the Anuttṭhubham.

47. That is Citrapadá, the quarters of which consist of two dactyls (B), and a spondee (Gá).
 48. That is Vijjummálá, the quarters of which consist of two molossi (M), and a spondee (Gá).
 49. That is Mánavakam, the quarters of which consist of a dactyl (B), an antibacchie (T), and an iambic (LG).
 50. That is Samániká, the quarters of which consist of a cretic (R), an amphibrach (J), and a trochee (GL).
 51. That is Pamániká, the quarters of which consist of an amphibrach (J), a cretic (R), and an iambic (LG).

In the Brahati.

52. That is Halamukhí, which has a cretic (R), a tribrach (N), and an anapæst (S).
 53. That is Bhujagasusu, which has two tribrachs (N), an in molossus (M).

In the Panti.

54. That is Suddhavarájitam, which has a molossus (M), an anapæst (S), an amphibrach (J), and a long syllable (G).
 55. That is Paṇavo, which has a molossus (M), a tribrach (N), a bacchie (Y), and a long syllable (G).
 56. That is Rummavatí, which has a dactyl (B), a molossus (M), an anapæst (S), and a long syllable (G).
 57. That is Mattá, which has a molossus (M), a dactyl (B), an anapæst (S), and a long syllable (G).
 58. That is Campakamálá, which has a dactyl (B), a molossus (M), an anapæst (S), and a long syllable (G).
 59. That is Manoramá, which has a tribrach (N), a cretic (R), an amphibrach (J), and a long syllable (G).
 60. That is Ubbháṭakam, which has an antibacchie (T), a molossus (M), a cretic (R), and a short syllable (L).

In the Tuṭṭhubham.

61. That is Upaṭṭhitá, which has an antibacchic (T), two amphibrachs (J), and a spondee (Gá).
62. That is Indavajirá, which has two antibacchics (T), an amphibrach (J), and a spondee (Gá).
63. That is Upavajirá, which has an amphibrach (J), an antibacchi (T), an amphibrach (J), and a spondee (Gá).
64. That is Upajāti, when the quarters of the two preceding metres are mixed together. Similarly it is said that the name Upajāti is applied to any metre that has mixed quarters.
65. That is Sumukhí, which has an anapæst (S), two amphibrachs (J), and an iambic (LG).
66. That is Dodhakam, which has three dactyls (B), and a spondee (Gá).
67. That is Sáliní, which has a molossus (M), two antibacchics (T), and a spondee (Gá), with the pause on the fourth syllable, and the seventh (following it).
68. That is Vátummissá, which has a molossus (M), a dactyl (B), an antibacchic (T), and a spondee (Gá), with the pause (on the fourth syllable, and the seventh following it).
69. That is Surasasirí, which has a dactyl (B), an antibacchic (T), a tribrach (N), and a spondee (Gá).
70. That is Rathoddhatá, which has a cretic (R), an amphibrach (N), a cretic (R): and an iambic (LG).
71. That is Svágatá, which has a cretic (R), a tribrach (N), a dactyl (B), and a spondee (Gá).
72. That is Bhaddiká, which has two tribrachs (N), a cretic (R), and an iambic (LG).

In the Jagati.

73. That is Vamsaṭṭha, which has an amphibrach (J), an antibacchic (T), an amphibrach (J), and a cretic (R).
74. That is Indavamsá, which has two antibacchics (T), an amphibrach (J), and a cretic (R).
75. That is Toṭaka, which has four anapæsts (S).
76. That is Dutavilambita, which has a tribrach (N) two dactyls (B), and a cretic (R).
77. That is Puṭa, which has two tribrachs (N), a molossus (M), and a bacchic (Y), with a pause at the fourth, and eighth syllable (following it).
78. That is Kusumavicittá, which has a tribrach (N), and a bacchic (Y), and again a tribrach (N), and a bacchic (Y).

79. That is Bhujangappayātam, which has four bacchics (Y).
80. That is Piyamvadā, which has a tribrach (N), a dactyl (B), an amphibrach (J), and a cretic (R).
81. That is Lalitā, which has an antibacchic (T), a dactyl (B), an amphibrach (J), and a cretic (R).
82. That is Pamitakkharā, which has an anapæst (S), an amphibrach (J), and two anapæsts (S).
83. That is Ujjalā, which has two tribrachs (N), a dactyl (B), and a cretic (R).
84. That is Vessadevī, which has two molossi (M), and two bacchics (Y), with the pause at the fifth syllable, and the seventh (following it).
85. That is Tāmarasam, which has a tribrach (N), two amphibrachs (J), and a bacchic (Y).
86. That is Kamalā, which has an anapæst (S), and bacchic (Y), followed by an anapæst (S), and bacchic (Y).

In the Atijagati.

87. That is Pahāsini, which has a molossus (M), a tribrach (N), an amphibrach (J), a cretic (R), and a long syllable (G), with the pause at the third syllable, and at the tenth (following it).
88. That is Rucirā, which has an amphibrach (J), a dactyl (B), an anapæst (S), an amphibrach (J), and a long syllable (G), with the pause at the fourth syllable, and ninth (following it).

In the Sakkarī.

89. That is Aparājita, which has two tribrachs (N), a cretic (R), an anapæst (S), and an iambic (LG), with the pause at the seventh syllable, and the seventh (following it).
90. That is Paharanakalikā, which has two tribrachs (N), a dactyl (B), a tribrach (N), and an iambic (LG), with the pause at the seventh syllable, and the seventh (following it).
91. That is Vasantatilakā, which has an antibacchic (T), a dactyl (B), two amphibrachs (J), and a spondee (Gá).

In the Atisakkarī.

92. That is Sasikalā, which has four tribrachs (N), and an anapæst (S).
93. When the pause falls on the eighth syllable, and the seventh (following it), the metre is called Maṇigūṇanikaro.
94. That is Mālinī, which has two tribrachs (N), a molossus (M), and two bacchics (Y) with the pause on the eighth syllable, and the seventh (following it).
95. That is Pabhaddakam, which has a tribrach (N), an amphibrach (J), a dactyl (B), an amphibrach, (J) and a cretic (R).

In the Aṭṭhi.

96. That is Vānini, which has a tribrach (N), an amphibrach (J), a dactyl (B), an amphibrach (J) a cretic (R), and a long syllable (G).

In the Atyaṭṭhi.

97. That is Sikhariṇi, which has a bacchic (Y), a molossus (M), a tribrach (N), an anapæst (S), a dactyl (B), an iambic (LG), with the pause at the sixth syllable, and eleventh (following it).
98. That is Hariṇi, which has a tribrach (N), an anapæst (S), a molossus (M), a cretic (R), an anapæst (S), and an iambic (LG), with the pause at the sixth syllable, the fourth (following it), and at the seventh (following the last).
99. That is Mandakkantā, which has a molossus (M), a dactyl (B), a tribrach (N), two antibacchics (T), and a spondee (Gá), with the pause at the fourth syllable, the sixth (following it), and at the seventh (following the last).

In the Dhuti.

100. That is Kusumitalatāvellitā, which has a molossus (M), an antibacchic (T), a tribrach (N), and three bacchics (Y) with the pause at the fifth syllable, the sixth (following it), and the seventh (following the last).

In the Atidhuti.

101. That is Meghavipphujitā, which has a bacchic (Y), a molossus (M), a tribrach (N), an anapæst (S), two cretics (R), and a long syllable (G), with the pause at the sixth syllable, the sixth (following it, and the seventh (following the last).
102. That is Saddūlavikkīlitī, which has a molossus (M), an anapæst (S), an amphibrach (J), an anapæst (S), two antibacchics (T), and a long syllable (G), with a pause on the twelfth syllable, and the seventh (following it).

In the Kati.

103. That is Vutta, which has ten trochees (GL).

In the Pakati.

104. That is Saddharā which has a molossus (M), a cretic (R), a dactyl (B), a tribrach (N), and three bacchics (Y), with the pause at every seventh syllable.
105. That is Bhaddaka, which has a dactyl (B), a cretic (R), a tribrach (N), a cretic (R), a tribrach (N), and a long syllable (G), with the pause on the tenth syllable, and on the twelfth (following it).

(Here ends) the third chapter (~~describing the~~ metres the quarters of which are similar.

106. That is Upacitta, which has in its odd quarters three anapæsts (S), and an iambic (LG); and in its even quarters, three dactyls (B), and a spondee (Gá).
107. That is Rutamajjhá, which has in the odd quarters three dactyls (B) and a spondee (Gá); and in the even quarters a tribrach (N), two amphibrachs (J), and a bacchie (Y).
108. That is Vegavatí, which has in the odd quarters three anapæsts (S) and a long syllable (G); and in the even quarters three dactyls (B), and a spondee (Gá).
109. That is Bhaddavirājam, which has in the odd quarters an antibacchie (T), an amphibrach (J), a cretic (R), and a long syllable (G); and in the even quarters, a molossus (M), an anapæst (S), an amphibrach (J), and a spondee (Gá).
110. That is Ketumatí, which has in the odd quarters an anapæst (S), an amphibrach (J), a cretic (R), and a long syllable (G); and in the even quarters a dactyl (B), a cretic (R), a tribrach (N), and a spondee (Gá).
111. That is Akhyāniká, which has in the odd quarters, two antibacchies (T), an amphibrach (J), and a spondee (Gá); and in the even quarters an amphibrach (J), an antibacchie (T), an amphibrach (J), and a spondee (Gá).
112. That is Viparītapubbá, which has in the odd quarters an amphibrach (J), an antibacchie (T), an amphibrach (J), and a spondee (Gá); and in the even quarters two antibacchies (T), an amphibrach (J), and a spondee (Gá).
113. That is Harinaplutá, which has in the odd quarters three anapæsts (S), and an iambic (LG), and in the even quarters a tribrach (N), two dactyls (B), and a cretic (R).
114. That is Aparavutta, which has in the odd quarters two tribrachs (N), a cretic (R), and an iambic (LG); and in the even quarters a tribrach (N), two amphibrachs (J), and a cretic (R).
115. That is Pubbitaggá, which has in the odd quarters two tribrachs (N), a cretic (R), and a bacchie (Y); and in the even quarters a tribrach (N), two amphibrachs (J), a cretic (R), and a long syllable (G).

These two metres (respectively correspond with) the Vetāliya (and Opac-chandasaka) metres.

116. That is Yavādikāmatí, which has in the odd quarters six trochees (GL); and in the even quarters six iambics (LG), with a final long syllable (G).

(Here ends) the fourth chapter (describing) metres, the half lines of which are similar.

117. In that class of metres having eight syllables in each quarter, that is Vatta, which has no anapæst (S), nor tribrach (N) after the first syllable; and which has a baccheic (Y) after the fourth syllable.
118. That is Pathyāvatta, which has in the even quarters, an amphibrach (J) following the fourth syllable.
119. That is Viparītāvatta, which has in the odd quarters, an amphibrach (J) following the fourth syllable.
120. That is Capalāvatta, which has in the odd quarters, a tribrach (N) following the fourth syllable.
121. That is the Vipulā of Piṅgala which has the seventh syllable short in the even quarters.
122. That is the Vipulā of Setava, which has the seventh syllable short in all the quarters.
123. That is Bha-Vipulā, which has a dactyl (B) following the fourth syllable.
124. That is Ra-Vipulā, which has a cretic (R) following the fourth syllable.
125. That is Na-Vipulā, which has a tribrach (N) following the fourth syllable.
126. That is Ta-Vipulā, which has an antibaccheic (T) following the fourth syllable.

(So much for) the Vatta kind (of metres).

127. Any metro not noticed here, having quarters dissimilar in character, is comprehended under the generic term *Gāthū*.

●
(Here ends) the fifth chapter describing metres the quarters of which are dissimilar.

-
128. In the table (representing the various long and short quantities of a metre), set down a quarter verse with quantities all long, below first long a breve, followed by same (as above), preceded by longs, and this is to be repeated until there are all shorts in the row.
 129. If the row number of a variation in the table can be halved set down a breve, if being odd a unit is required set down a long quantity.
 130. From the first syllable write below each, numbers in progression from one, the sum of the figures beneath the short quantities, *plus* one, is the indicator.
 131. Write units one over another in number equal to the syllables of a quarter verse *plus* one, let each column be one less in number than the one preceding, let there be a rising from one and so on, the result is all longs and the like.
 132. The number of the possible variations of a metre may be determined by the preceding method, or by the one preceding that.

133. Twice the number of variations in a given metre, *minus* one, gives the measurement in inches of the long, and the short quantities, and the intervals between them.

(Here ends) the sixth chapter entitled the six problem section of the *Vuttodaya* composed by Saṅgharakkhita Thera.

134. To supply a public want, this treatise was prepared under the encouragement of my benevolent preceptor, the venerable Sila Thera, residing at Selantara, to whom I wish every success.
135. In return for this benefit, may I in successive births be a benefactor to others.
136. May mankind attain the fulfilment of their desires as easily as I solved these six problems.

The Vuttodaya is ended.

NOTES.

Notes on Chapter I.

- v. 1. *nam' atthu* for *namo atthu* ; *odata* for *avadāta*. "Ettha ca paṭhama gathāya parammukhakarapaṃ dasseti, sesahi gandhārambhappalādike-tāni pākataṃ yeva." *Kav.*
- v. 2. *Pingalācariyādāhi*. "Setava bharamantaṭṭyādinaṃ" *Chando*. "ādi-saddona e'ttha Jayadevasurāma Kālidāsādāyo Saṅgaṇhati" *Vac.* and *Kav.*
chandam yam. "chandam niggaḥitāgamena" *Kav.*
yat' icchitam for *yato icchitam*. "tesam icchitam abhimatam chand-sattamapariññatam yato yasmā kāraṇā na sūdheti, nasammadeti, tato tasmā kāraṇā Māgadhabhāsāya Vuttodayam ārabbhisaṇṇi ti sam-bandho" *Chando*. "yat' icchitan ti vadati, yad icchitan ti pi vat-tum vuttati, yaṃ ti hi padassa yasmā ti attho pi sambhavato Māga dhabhāsāyāti." *Vac.* *Kav.* gives the substance of the above.
- v. 3. *mattāvannaṇavihedaṇam*. Pāli poetry is divided into poetry mea-sured by the time occupied in the pronunciation (*mattā*), and poetry regulated by the number of syllables (*vaṇṇa*). The first of these is also called *Jāti*.
lakkhyalakkhanasamyuttam. "lakkhalakkhanasamyuttam." *Kav.*
"lakkhiyate ti lakkhaṇam udāharāṇam lakkhiyate 'neñeti lakkhaṇam suttam lakkhaṇa ca, lakkhaṇa pa, lakkhalakkhaṇa lakkham ova vā lakkhaṇam lakkhalakkhaṇam tehi tena vā samyuttam, lakkhalakkha-

pasamyuttam suttam eva udāharāṇaṃ ti vuttam hoti." *Chando*. "lakkhitabban ti lakkhaṇaṃ tad eva lakkhyam udāharāṇaṃ, lakkhiyate anenāti lakkhaṇaṃ suttam lakkhaṇaṃ ca tam lakkhaṇaṃ, cāti lakkhyalakkhaṇaṃ" *Vac*.

v. 4. *vuttodayam*, for vutta + udayam.

lokiyacchandaniissitam. A collection of prosody not vedic. "na vedikacchandaniissitam, duvidham chandam, lokiya-vedika-chanda-bhedena, tattha lokiyannāmachandam nakkhattapaṭhādikaṃ; vedikannāmachandam vijjābalenākāse gamanādikaṃ; tesu pajjabandhes-vāpajojaniyattādhippetam veditabbam." *Kav*. *Chando*. nearly the same.

ārabbhissām' ahan' dāni. "ārabbhissan ti Māgadhabhāsāya upaṇṇāpayissāmi" *Chando*. ārabbhissāmi aham idāni ti padacchedo" *Vac*. "ārabbhisāmi ahan ti padacchedo Vacanattahajotikāyam pan' ārabbhissam ahan ti vuttam, dvisu ca yathākkamaṃ ārabbhissām' ahan ti ca pāṭho datṭhabbo." *Kav*.

v. 5. *aṭṭhagaṇā*. Eight feet. These are subjoined.

<i>Symbols.</i>	<i>Syllables.</i>	<i>Names (from the Greek).</i>
Ma.	— — —	Molossus.
Ya.	◡ — —	Bacchius.
Ra.	— ◡ —	Creticus.
Sa.	◡ ◡ —	Anapaustus.
Ta.	— — ◡	Antibacchie.
Ja.	◡ — ◡	Amphibrachys.
Bha.	— ◡ ◡	Dactylus.
Na.	◡ ◡ ◡	Tribrachys.

A long syllable is *garu* (Ga), a short or breve *lahu* (La), and the initials GL are thus used.

Ga Ga or Gá.		Spondæus.
La La or Lá.	◡ ◡	Pyrrhichius.
Ga La.	— ◡	Trocheus.
La Ga.	◡ —	Iambus.

The *Kavisāra* has some fanciful remarks in connection with the eight prosodial feet, the substance of which is given in the subjoined tables.

Table 1.

The names of the guardian celestial beings, lunar mansions, &c., connected with the eight prosodial feet.

Feet.	Symbols.	Name of guardian celestial being.		Result.	How regarded.	Numbers and Names of Lunar mansions.	
— — —	ma	bhumi.	earth.	wealth.	coveted.	18	Jetthā.
U U U	na	sakka.	Indra.	long life.	coveted.	2	Bharaṇī.
— U U	bha	canda.	moon.	friends.	coveted.	5	Magasiram.
U — —	ya	ambha.	cloud.	piety.	coveted.	24	Satabhisayo.
U — U	ja	ravi.	sun.	poverty.	not coveted.	7	Punabhasu.
U U —	sa	anila.	air.	degradation.	not coveted.	15	Sāti.
— U —	ra	anala.	fire.	conflagration.	not coveted.	3	Kattikā.
— — U	ta	ākāsa.	firmament.	failure.	not coveted.	22	Savaṇo.

Table 2.

Classification of letters into castes.

Brahmaṇa.	a á k ñ c ũ ṭ ṇ
Khattiya.	i o t n p m y r
Vāṇijja.	u o l v
Sudda.	s h l

- v. 6. *gaṇo idha catukkalo*. The Ariyā class of metres is measured by feet denominated *gaṇa*, which are equivalent to two long syllables or four breves (*kala*). “catukkalo caturo kalā mattā assāti va * * * ádittayaṃ pana eko garu dve lahu, massa pana dve garu, nassa tu lahu catukkaṃ, tasmā catukkalo ti vutto.” *Vac.*
- v. 7. *Samyogādi*. Double consonants and the like. “saṃyogo nāma dvinaṃ vyañjanānaṃ ekatra thiti vuccati, sarānantarikā vyañjanānaṃ yogato pi yathā; “tattha, dinnā, hutvā” tyādi: diḡho ca saro yathā; “gāto, pitā, bhūto, deti, sotthi, ettha, oṭṭho,” ti: niggahita-paro yathā; “yaṃ, taṃ” tyādi: * * * catunnaṃ pādānaṃ anto

avasānam ti pādanto saro ca yathā ; “suriyuggamanam paṭi” tyādi, ime caturo sarā garu ti daṭṭhabbam.” *Vac.*¹

The *Rūpasūldhi* has “kvaci samyogato pubbā ekārokāra rassa iv, uccante yathā ; ettha, seyyo, oṭṭho, sotthi.” *Bk. 1. Chap. 1. Sutta 5.*, but in the earlier commentary on *Kaccāyana’s Grammar*, the *Nyāsa*, no mention is made of this shortening of heavy vowels.

pādanto. This is the Burmese reading supported by the commentaries. *Kavisūra* has “chandānurakkhattam padanto ti vuttam pādanto ti pi pātho,” but so long as a couplet of the *Vatta* class of metres conforms to the principles of that class, it is immaterial what foot follows the fourth foot in the odd quarter.

vanko * * * *uju*. In Burmese, the mark for the short quantity in Pāli prosody, is the number for one in that alphabet, and the mark for the long quantity is the number for two.

mattiko. Consisting of a breve (*mattā*). Equal in time to a snap of the finger, a flash of lightning, or the twinkling of an eye. “mat-tāsaddo c’ettha accharāsaṅkhātam vā, vijjutāsaṅkhātam vā, akkhi-nimilasaṅkhātam vā, kālam vadati ti daṭṭhabbam, tathā pi tena mat-tena ekamattā rassā, dvimattā dīghā, aḍḍhamattikā vyañjanā ti” *Nyāsa Bk. 1. Sutta 4.*

- v. 8. *pādūli*. This rule refers to poetry measured by the time occupied in the pronunciation (*mattāvutti*), which is divided by pauses into quarters (*pādas*). The illustration subjoined is in the Pathyā metre of the Ariyā class in which the pause is commonly restricted to the close of third foot.

saññata kriyā. The shortening of the final *a* in *saññata* before two consonants, the last of which is the liquid *r*, resembles the *muta cum liquida* rule, and the *positio debilis* of Latin prosodians ; *e. g.* *integri*, (comp. Weber, *Ind. Stud.*, Vol. viii). The stanza may be freely translated thus :—

• From the pleasure of seeing and hearing Buddha, springs
a passion never sate.

Who would not derive pleasure from a study so wondrous and
sublime ?

The *Chando*. points out that this couplet illustrates the figure of Rhetoric called Transition (*atthantaranyāsa*), the introduction of another sense into a subject, (such as a moral reflection). The author describes this figure in his *Subodhālaṅkāra* (*Easy Rhetoric*) vv. 241 to 245. It is twofold, *vis.* :—

¹ It is also an established rule in Pāli prosody that consonants may be doubled, in order to give prosodial length to a naturally short vowel (*vide* v. 134.)

(a). general, (*sabbavyāpi*—).

(b). partial, (*visesaṭṭha*—).

each kind being distinguished by the absence and presence of the emphatic particle *hi*. In this instance it is *partial transition* without the particle *hi*, (see *Jour., As. Soc. Beng.*, Part I, No. 2, 1875, pages 100 and 119.)

- v. 9. *Samuddosurasādinam*. *Samuddo*, *usu*, *rasa*, and such like symbols represent numerals. Numerical symbols occur only in the second, third, and fifth chapters, and are here subjoined.

Number 4. *veda*. the (four) vedas vv. 67. 79.

yuga. the (four) ages, vv. 77. 98. 99.

samuddo. v. 9.

aṇṇava. vv. 39. 117. 123. 125. 126.

ambudhi. v. 75.

jaladhi. v. 120.

sindhu. vv. 118. 119.

{ The (four)
occans.

Number 5. *usu*. the (five) arrows of Cupid, v. 9.

akkhi. the eye, one of the (five) senses, v. 100.

Number 6. *rasa*. the (six) tastes, vv. 9. 97. 98. 101.

utu. the (six) seasons, vv. 99. 100. 108.

Number 7. *assa*. vv. 67. 84. 99. 101. 102. { the (seven) horses
haya. vv. 92. 93. { of the sun.

muni. v. 104.

isi. vv. 94. 98. 100. { the (seven) sages.

sara. the (seven) musical notes, v. 89.

Number 8. *vasu*. a certain tribe of demigods, vv. 37. 41. 77. 93.

bhoga. wealth, v. 94.

Number 9. *gaha*. a planet, v. 88.

Number 11. *hara*. one of the eleven Rudras, v. 97.

Number 12. *akka*. The sun, one to each month, v. 102. 105.

padacchedo yati bbhave. Verse division is *yati*, the harmonic pause. The subject is treated of in the author's *Subodhāṇṅkāra* (*Easy Rhetoric*) vv. 49. to 55.¹ *Pada* here means a portion, not a quarter, of a verse.

- v. 12. *ekakkhar' drabbha*. for *ekakkharam ārabba*.

Quarter verses vary from one up to twenty-six syllables. In this treatise they range from the *Gāyatti* of six syllables, to the *Akāti* of twenty-two syllables. The five metres preceding the former, and the four following the latter omitted here are :—

¹ See *Jour., As. Soc. Beng.*, Part I, No. 2, 1875, pp. 96 and 108.

- | | |
|---------------|-------------|
| 1. utta. | 1. vikati. |
| 2. atyutta. | 2. saṅkati. |
| 3. majjhā. | 3. atikati. |
| 4. paṭiṭha. | 4. ukkati. |
| 5. supaṭiṭha. | |

- v. 13. *paratṭha*. Elsewhere. The work referred to, is the *Chandovicitta*. The metres are Bacchanalian chants, unlimited in length, commencing with two tribrachs (N), followed by cretics (R).
- v. 15. t' ettha for te ettha.

Notes on Chapter II.

- v. 16. This chapter describes Pāli metres regulated by time (*mattāvutti*), called Jāti. They are four in number Ariyā, Gīti, Vetāliya, and Mattāsamaka; the second, however, is merely a subdivision of the first. The Ariyā class uses feet containing four instants or breves, or their equivalents; namely:—

dactyl	—	∪	∪	B.
amphibrach.....	∪	—	∪	J.
anapæst	∪	∪	—	S.
spondee		—	—	Gā.
proceleusmatic	∪	∪	∪	NL.

Any one of these may be used in the even feet, *viz.*, the second, fourth, and sixth. The amphibrach (J) is inadmissible in the odd feet, *viz.*; first, third, fifth, and seventh. In each half verse, which consists of seven and a half feet, the sixth foot must be an amphibrach, or proceleusmatic, or a single breve. The metres are musical lyric verses. Mr. C. P. Brown in his treatise on Sanskrit Prosody, has pointed out a metre in Horace similar to the Ariyā, the Ionic *a Minore* "*Miserarum est*" &c., (Od. iii. 12). The choruses in the *Bacchæ* of Euripides are principally in this metre.¹ Subjoined is the scheme of the four Jāti from verse 16 to 43, inclusive.

	1	2	3	4	5	6	7
Ariyā, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Pathyā, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Vipulā, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Capalā, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Mukhacapalā, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Jaghanacapalā, .. { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Gīti, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Upagīti, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Uggīti, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —
Ariyāgīti, { 1st 2nd	— —	— —	— —	— —	— —	— —	— —

III. *Vetāliya*.

	Odd quarters.				Even quarters.			
Vetāliya.	U	U	U	U	U	U	U	U
Opacchandasaṅga								
Apātalikā.								
Lakkhanatikā.	U	U			U	U		
Udiccavutti.	U	U	U					
Paccavutti.								
Pavattaka.	U	U	U					
Aparantikā.	U	U	U	U				
Caruhāsini.	U	U	U					

IV. *Mattāsamaka*.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Acaladhiti.	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mattāsamaka.									U							
Visiloka.	U	U			U		U	U								
Vānavāsikā.									U	U	U	U	U			
Citra.					U			U	U		U					
Upacitra.										U		U		U		
Padakulakam.																
Citra.																
Visiloka.		U		U	U		U	U								
Vānavāsikā.									U		U					
Visiloka.	U	U		U	U		U	U								

V. 44. If the first half of verse 17 be taken, the number of instants, of syllables, of long and short quantities is as follows:—

Instant	.....	28	
Syllable	.....	20	
Long	.....	8	
Short	.....	12	
Then, 28	— 8	= 20	the number of syllables.
28	— 20	.....	= 8
28	— 12	= 16 ÷ 2	= 8 { the number of longs.

Notes on Chapter III.

This chapter describes those metres the quarters of which are similar, giving in each instance the characteristic of one quarter, which answers for the remaining three. The syllables in each quarter vary from six to twenty-two. The names of these metres are:—

VI. Gáyatti.	XIV. Sakkari.
VII. Uphi.	XV. Atisakkari.
VIII. Anutthubham.	XVI. Atthi.
IX. Brahati.	XVII. Atyatthi.
X. Panti.	XVIII. Dhuti.
XI. Tutthubham.	XIX. Atidhuti.
III. Jagati.	XX. Kati.
XIII. Atijagati.	XXI. Pakati.
XXII. Akati.	

The feet are denoted by the initial letter of their symbols in Roman capitals.

VI. Verses having six syllables in each line.

1. *Tanumajjhá.* — — ∪ ∪ — — TY.

ñānam dasamaddhe
ñeyye tava satthá
vittháritamási
samgetarabhága.

VII. 1. *Kumáralalitá.* ∪ — ∪ ∪ ∪ — — JSG.

tayásadisakhettham
nalokataramasmim
padakkamanumattham
vipaccatiminampi.

VIII. 1. *Citrāpadā*. — ◡ ◡ — ◡ ◡ — — 2BG4.

satyakulapparacandaṃ
 tittiyapannakavindaṃ
 saññanapaññadinandaṃ
 sādhuññānesamanindaṃ.

2. *Vijjummāla*. — — — — — 4G4.

jāte buddhā vijjabbhute
 loke dhammaṃ loke niccaṃ
 mohaddhittaṃ hitvā sattā
 pattāsantaṃ yogakkhemaṃ.

3. *Māṇavakam*. — ◡ ◡ — — ◡ ◡ — BTLG.

ānanaverīkamalaṃ
 pañcayaketebhagavā
 yānasakhāhamsavaro
 sūcayatevassupadam.

4. *Sāmaṇikā*. — ◡ — ◡ — ◡ — ◡ 4GL.

ānanenatemuninda
 tulyaminnasobhadāni
 locanenakeravāni
 tośatesamakhatāya.

5. *Pāmāṇikā*. ◡ — ◡ — ◡ — ◡ — 4LG.

saroruhāmuninda te
 sasāmi vaṃsajattanaṃ
 paṭiccasampatitiyā
 itivade padassitā.

IX. 1. *Halāmukhī*. — ◡ — ◡ ◡ ◡ ◡ ◡ — RNS.

vaṇṇayantitavakarunā
 vitthatatisugatajāne
 nevamāravadhūvisaye
 sādhanampi viditavati.

2. *Bhujagāsusu*. ◡ ◡ ◡ ◡ ◡ ◡ — — — 2NM.

vivaritamamatadvāraṃ
 suvihatabhavaśāñcāraṃ
 kavivaranutasaccāraṃ
 panamarakharasatthāraṃ.

X. 1. *Suddhavirūjitam*. — — — ◡ ◡ — ◡ — ◡ — MSJG.

khittirūtijinassapatthā
 āpātālasuramlayāvadhi
 sānandhekasuroragādike
 ānetvācaraanāte akā.

2. *Paṇavo*. — — — ◡ ◡ ◡ ◡ — — — MNYG.

saṃsārambudhi tarape setu
 hetuṃ nibbutisukhasantāne

kotum sakyabhijanasaññe
bho nātham visayatha viññāṇe.

3. *Rummavati*. — ◡ ◡ — — — ◡ ◡ — — BMSG.

sārasayonīnam bhavanēva
devanarāhitaṃ nila^{ya}evā
nevatayā tulyomadhiková
vajjatimaddhá so munirājā.

4. *Mattā*. — — — — ◡ ◡ — — MBSG.

māyādvīsutamarahantaṃ
dhammassāmiṃ varasalabhiññam.
niccam saddhá yutamanaśāham
vandesuttham bahugunayuttaṃ.

5. *Campakamālā*. — ◡ ◡ — — — ◡ ◡ — — BMSG.

āsavaṃśāsmocayateyaṃ,
mārajilokaṃśokasayāvā
jālinijālāpālayate bho
ñānagunaggo, kāruṇikaggo.

This metre is the same as No. 3. In *Vṛttaratnākara* it is named *Dīpakamālā*, and has J instead of S for the third foot.

6. *Manoranā*. ◡ ◡ — ◡ — ◡ — ◡ — NRJG.

yatipatīpsatam kavissaro
kimitimāhumeruśādisam
naccalateva sohi kappase
tuyamanāratam dukhadhite.

7. *Ubbhāsakam*. — — ◡ — — — — ◡ — ◡ TMRL.

khīṇe kalanko cando jinaśśa
sappunṇasamsuddhācchodakena
tulyonavattenāśisuehi
dośakarotiṃ vā tulyameti.

- XI. 1. *Upaṭṭhitā*. — — ◡ ◡ — ◡ — ◡ — — T2JGá

suddhodaniyam parapātubhūtam
sāmājjikalūpi sadā pamodī
dūrikatatitthiyahāṇasayuttaṃ
saddhammapayodavaraṃ namāmi.

In the *Vṛttaratnākara* the *Upaṭṭhitā* ending with a single long syllable is a ten-syllabled verse, and is included in the *Pankti*. There is, however, an *Upasthitam* in the *Trishṭubh*, but it has not the characteristics of the Pāli *Upaṭṭhitā*.

2. *Indavajirā*. — — ◡ — — ◡ ◡ — ◡ — — 2TJGá.

satthābhajīketumalam phalam va
satthussa dattam pavaram pūram va
rājāva jetā samadantakattham
netāva satthē nayanocitattham.

3. *upavajirā*. ◡ — ◡ — — ◡ ◡ — ◡ — — JTJGá.
 balena mettāyacitāya satthu
 vihárasāmantavanābhivāso
 migāpivālasāhitāmramaññaṃ
 carimṣu yogīva sāmāhitattā.

V. 64. When the quarter verses of Nos. 2 and 3 are mixed together, the metre is called *Upajāti*; of which according to *Chando*, there are fourteen varieties, thus, if *i* stands for *Indavajirā*, and *u* for *Upavajirā*, we have *iuuu*, *uiii*, *iiui*, *uiiu*, *uiiu*, *uiuu*, *iiiu*, *uuui*, *iiuu*, *uiii*, *uiui*, *uiiu*, *uiui*, *uiiu*.

4. *Sumukhī*. ◡ — ◡ — — ◡ ◡ — ◡ ◡ — S2JLG.
 ariyehi sīlasamādhī ṭhiti
 succimattikādiguṇehi jīno
 vimalāhi bhūsayatevisayo
 sasamipupāgata devanare.

In the *Vṛittaratnākara*, *Sumukhī* has a N instead of a S for the first foot.

5. *Dodhakam*. — ◡ ◡ — ◡ ◡ — ◡ ◡ — — 3BGá.
 sajjanamānasakañjuvikāsaṃ
 dujjanatitthiyaṣaṇṇakapatāpaṃ
 lokanabhuggatamārajaśūraṃ
 mohatimūṣahataṃ paṇamāmi.

6. *Sālinī*. — — — — — ◡ — — — — M2TGá.
 pādambhojaṃ ye bhajante janāte
 kārunnantesimavajjaṃ janesu
 vindante tenāthatassāgatena
 vaṇṇaṃ kovā vaṇṇa ye vaṇṇavādi.

7. *Vātummissā*. — — — — || ◡ ◡ — — ◡ — — ||
 MBTGá.

laddhāmaddhā || tavamaddhekkhaṇampi
 sattāsattā || bhupadāyanti niccaṃ
 kiṃ vā cittaṃ || citasatthopakare
 sabbaññūsinip || tadanūnappavatti.

The *Vṛittaratnākara* has no cæsura.

8. *Surasasirī*. — ◡ ◡ — — ◡ ◡ ◡ ◡ — — BTNGá.
 vādivarāpissunipunadhīyo.
 tādiguṇantaṃ sugatamupecece.
 pañcamukhādhiṭhitavanagantyā.
 vañcitadanticchavimadbikañceṇ.

The *Vṛittaratnākara* has the pause after the fifth syllable, and the sixth following it.

9. *Rathoddhatā*. — ◡ — ◡ — ◡ — ◡ — ◡ — ◡ — RNRLG.
yassa pādakiraṇārūṇigatam.
dārukhandam api pātihāriyam.
dassayitvasumanañcaneakā.
tassa attham iha kō silāghaye.
10. *Svāgatā*. — ◡ — ◡ — ◡ — ◡ — ◡ — ◡ — RNBGā.
nijjitāni kamalāni mukhena.
lajjitā vacanavāsamitāte.
nātathā padarasanti nimittam.
majjitānisarasiv iti maññe.
11. *Bhaddikā*. ◡ ◡ ◡ ◡ ◡ ◡ — ◡ — ◡ — 2NRLG.
magadhavisayabhāvibhāsaya.
vadatitayimahovadanti to.
vividhavisayavāsijantavo.
sugatasakasakāyabhāsaya.
- XII. 1. *Vamsaṭṭha*. ◡ — ◡ — — ◡ ◡ — ◡ — ◡ — JTJR.
visālabhogesumasamgatam gatam.
visudhisantam bhavasamvaram varam.
paropakārādhiakatapparam param.
bbajantunātham vidhitā hitam hitam.
2. *Indavamsā*. — — ◡ — — ◡ ◡ — ◡ — ◡ — 2TJR.
tuyhānasattādhigamā mahāmune.
līlāvilāsekarasā manohara.
kantāpi passanti sahasabhāsiyo.
sattā yathā jaṅgamaputirañceyam.
3. *Toṭaka*. ◡ ◡ — ◡ ◡ — ◡ ◡ — ◡ ◡ — 4S.
sucirāvahitam vahitam sahite.
niratehidhaya sugato padavī.
sigavam ujarūjapatham kathavā.
sujanā tannaram madhiro hatavo.
4. *Dutavilambita*. ◡ ◡ — ◡ — ◡ — ◡ — ◡ — N2BR.
subhagatā bhagatā pavinonadī.
surasabhārasabhāvita bharati.
adhigatādhigatātisivappadam.
jīnasutūnasutābhavasam kaṭam.
5. *Paṭa*. ◡ ◡ ◡ ◡ || ◡ ◡ — — ◡ — — || 2NMY.
sugatati || vidhakalyāṇehi yuttā.
vacanaṇa || ladamālāte janānam.
nakumati || malinattham yevadhotā.
sugatasu || rataruppesapaputtā.
6. *Kusumavicittā*. ◡ ◡ ◡ ◡ — — ◡ ◡ ◡ ◡ — NYNY.
ratipatijammam, jitamunidhammam.
sivapathasālam, munijanamālam.

- tibhavanaketum, subhagunahetum.
bbajathajanābho, tamihusulābho.
7. *Bhujāṅgapayāta*. ◡ — — ◡ — — ◡ — — ◡ — — 4Y.
munindo virāgāya viṇḍassa kando.
dinandadvayānandā sandosasando.
nabhindampinibbindakathenanindam.
virājeti rājinda kundogha cando.
8. *Piyanvadi*. ◡ ◡ ◡ — ◡ ◡ — ◡ — ◡ — ◡ — NBJR.
vimalacārueiraṇārunappabhā.
valitapādanakharāmsisantati.
kalilavindumalatānuyodadhi.
cchavisamuppahati te tathāgatam.
9. *Lalita*. — — ◡ — ◡ ◡ — ◡ — ◡ — TBJR.
taṇhā kilesamaladhovanārahe.
sattāpavaggapurarodhanāsahe
dhammepasannamatayohitāvaso.
dhammanusattanihasabbalamkathā.
10. *Pamitakkharā*. ◡ ◡ — ◡ — ◡ ◡ — ◡ ◡ — SJ2S.
lapitam tavāmata padam savanā
caraṇam munindanakarotidhayo
nahitena sādisanihina jano
gūṇabhājanatthamathavāvigato.
11. *Ujjalā*. ◡ ◡ ◡ ◡ ◡ — ◡ ◡ — ◡ — 2NBR.
sapavaravisayosusamiddhiko
savigatakhilamītisukhemavā
sasujanajanasevaniyojati
dasabalagaditam lapatevate.
12. *Vessadevī*. — — — — — || — ◡ — — ◡ — — ||
2M2Y.
saṃsare saram || mānusattamtaḥimpi
vekaḷlābhāvo || sādhu sabbindriyānam
kolaṇṇam tasmim || tassasoceyyabhāvo
tasnim sussesu || dhammarājassa dhammam.
13. *Tāmarasam*. ◡ ◡ ◡ ◡ ◡ — ◡ ◡ — ◡ — N2JY.
yadi sugatodita sārāpadīpo
bhuvinaṣiyanīyārāyanasodham
sugatipathāvarāṇāpagamaṇi vā
nabhavatiko vadatissivanāmaṇi.
14. *Kamalā*. ◡ ◡ — ◡ — — ◡ — ◡ — — SYSY.
avakārakānaṇpi narādhamānaṇ
hitakārako yaṇ sadayo munindo
upalopasaṇ ghaṭṭitamō sadhāni
na haranti kiṇ vā balavaṇ pi vyādhi.

XIII. 1. *Pahúsiní.* — — — || ◡ ◡ ◡ ◡ — ◡ — — ||
MNJRĠ.

satthára || bhavasalilákarámapará.
lokoyam || ariyápatattharenasáram.
nibbáná || mataparátirakhemabhúmi.
sannito || dipuladayáyacoditena.

2. *Bucirá.* ◡ — ◡ — || ◡ ◡ ◡ ◡ — ◡ — ||
JBSJĠ.

manuññitá || yatipatinákharásaná.
yadátute || kusumavitánatam gaḇá.
tadávadhí || kusumasarábhidhárítam.
gatotime || matiuanuucemahámune.

XIV. 1. *Aparájitá.* ◡ ◡ ◡ ◡ ◡ ◡ — || ◡ — ◡ ◡ — ◡ — ||
2NRSĠĠ.

janananidhanatá || dyane kavisádhinam.
sugatataavavaco || bahuvasurosadham.
kamutataavavilá || savásamanorátham.
vitanutanusiri || bbilocanamussavam.

2. *Paharāṇakaliká.* ◡ ◡ ◡ ◡ ◡ ◡ — || ◡ ◡ ◡ ◡ ◡
◡ — || 2NBNĠĠ.

surapurakamalá || sananilayamatí.
varapatikamalá || karasasisavibhú.
tatharivakamalá || nicasitapasite.
sacarāṇakamalá || vahatiyatipatí.

3. *Vasantatiluká.* — — ◡ — ◡ ◡ ◡ — ◡ ◡ — ◡ —
TBIJĠá.

lávanyaváripipipúrivalitharaṅgam
nettambujálakamalissitapeṇamalyá.
kantápakáramadanásanavam kaghatto
sattambuje muni vinocayidosanáya.

XV. 1. *Sasikalá.* ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ —
4NS.

parahitamabhirata dasabalam atulo
piyatamaruciyanijatanujadayatá
amitavaradhanasipitasubhāṇayane
guṇasadanapatidhādivimalamatimá.

2. *Maṇigūṇanikaro.* ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ ◡ || ◡ ◡ ◡ ◡ ◡
◡ ◡ — || 4NS.

vidhuragūṇanīlaya || tiracaturamuno
tavalapanapasuta || lapitamadurāsam
pacuratarabhujaga || manujasurapitá
mahamadhupasamiti || pivatimaviratam.

3. *Malinā*. ○ ○ ○ ○ ○ — — || — ○ — — ○ — —
2NM2Y.

kapilakapaccarāṇaṃ || lokikācelakāṇaṃ
sivajāyiminivedaṇaṃ || tādinaṃ vādavedi
tavacarapaṇisedhī || cāpimāsajjajāta
anadhivarapabhāte || tetamosaṃhatīva.

4. *Pabbaddakam*. ○ ○ ○ ○ — ○ — ○ ○ ○ — ○ — ○ —
NJBJR.

phalamakhilaṃ tayāvijitamujjhiyāvudhe
disidisiḃhpalāyinaṃacissatenataṃ
suravanitānaṃāsīhasanāyidānipi
dasabalateparakkamamahosupatthataṃ.

- XVI. 1. *Vānini*. ○ ○ ○ ○ — ○ — ○ ○ ○ — ○ — ○ — —
NJBJR.

bhuvikavinokālākaladipāradassinova
bhujagapatimatisamatināganāyākāvā
nahitaṇṇitaṃ bahuṣugatasaggaṇamburāsī
bahupamitaṃ tathāhisūrapañcusaṃsavā.

- XVII. 1. *Sikharinī*. ○ — — — — || ○ ○ ○ ○ — — ○ ○
YMNBSLG.

natam cittaṃ yante || samitasakalaklesaphalinā
vajote jasatte || bhavakasiritomocanamayo
vanekekipsitvaṃ || savadhapasutaṇṇivādhapadhaṇaṃ
jinate pacceke || samabhinivisarīnādhapavaro.

2. *Harinī*. ○ ○ ○ ○ ○ — || — — — — || ○ — ○ ○
NSMRLG.

virataramano || pyāyaṃ nātho || pavedhatinibbhaṇaṃ
vyasanisudayā || luttāniccaṃ || samekkhiyakūtare
tam idam ucitaṃ || tesamloke || nissākararaṃsinā
bhavatisāsikaṇaṃ || taṃ yevambūṇaṃ || nacetaraṇvophaḷā.

3. *Mundakkantā*. — — — — || ○ ○ ○ ○ ○ — || — ○
MBN2TG.

ullocittam || jaladavisarā || yantivātācayassa
niyyānaṃsiṃ || surabhikūṣaṇaṃ || santarantepurattā
ubbhijjivā || vanisarasijā || sampatṭicchantipāle
soyaṃ natho || vipulapatīnā || pātunoṇevadevā.

- XVIII. 1. *Kusumitalatāvellitā*. — — — — || ○ ○ ○ ○ ○ — ||
MTN3Y.

sandhatthemeyaṃ || kisalayadalaṃ || tedhirattābhimukkh
mālīñṇaṃ cando || tavātanupabhaṃ || sammukhedeṇadeva
gopācuttānaṃ || vipulamatiyā || sammukhetepayodhi
sādisaṃ kiṃ vā || bhavatiḃbhuvane || tena tvaṃ vātulyo.

- XIX. 1. *Meghavipphujjita*. — — — — — || — — — — — ||
 — — — — — || YMS2RG.
 sarojemadisa || sasacakumude || tuñcasabbam tilokam
 pabodhetárobo || jīṇanamadikā || kintubhedopanesam.
 punosamghocittam || nalinakumuda || yantissesehibuddha.
 tayābuddholokā || napunamakulat || tham kadāci piyāti.
2. *Saddulavikkhita*. — — — — — || — — — — — ||
 — — — — — || MSJS2TG.
 māyānekatiluddharakkhasivasam || yātemanāsekadā.
 yosamyattikavāṇijedasasata || ddhaddhedayitvānabhā.
 vāhopissalilākaraṃsumabhilaṃ || ghitvānakhemāviui.
 sammāpesikimbhutasamadhunā || sabbaññutattthedayā.
- XX. 1. *Vutta*. — — — — — || — — — — — ||
 — — — — — || 10GL.
 sūmidavatāpasāritesvivāyatesupānisamputesu.
 yopadepadesamuggatesuphullamaṃ kajesusobhaṇesu.
 sañcaraṃ virājirājahaṃsalilayā pajāhitāyātassa.
 vārijāsāṇipadevarājasekharikatam padam bhajāmi.
- XXI. 1. *Saddharā*. — — — — — || — — — — — ||
 — — — — — || MRBN3Y.
 āvelāvelajātā || sitasitamāju || tarohiceabhedā
 kintiniggamnadehā || tibhuvanakuhamam || tetilokekanāthā
 sambhusentovanānā || vidhiratanamayā || nekamālāhisamunā
 sandhāvatyābhavaggaṃ || niravadhikaruṇā || āṇatam sucayantā
- XXII. 1. *Bhaddaka*. — — — — — || — — — — — ||
 — — — — — || BRNRNRNG.
 sakyamunevacotavasudhā |
 gadaṃ harati lobhadosaṃpabbhūti ||
 neva jābātiddhammapakātī |
 nasammutinatavisāradagayā ||
 kammaphalañca kammap ihabhū |
 navedagajanonakarakamitī ||
 sūcayattatadacchariyataṃ |
 vidanti sanarāmarāsivapadam. ||

Notes on Chapter 4.

This chapter describes eleven metres the half lines of which are similar in construction.

Notes on Chapter 5.

This chapter describes the varieties of the **Vatta**, or heroic, measure, analogous to the Sanskrit *sloka*. The term *sloka* is not used in the treatise, nor, according to Weber, does Piṅgala nor Kedarā adopt it. *Ind. Stud.*, Vol. VIII, pp. 114 and 332.

In this class of metres each half line contains sixteen syllables, and two half lines form a couplet. The halves are independent, any one of one metre may be followed by that of another. Each quarter (or pāda) has eight syllables, the first and third are called odd quarters, the second and fourth even quarters. In each quarter the first and last syllables are free, the others (which in the subjoined table are formed into seats) are subject to rule, namely:—

(a.) In the first seat in either quarter any foot is admissible, except the anapest (S), and the tribrach (N).

(b.) In the second seat in the odd quarters any foot is admissible.

(c.) In the second seat in the even quarters, no foot is admissible, except the amphibrach (J) or bacchie (Y).

	Odd quarter.				Even quarter.			
	Free.	1st Seat.	2nd Seat.	Free.	Free.	1st Seat.	2nd Seat.	Free. Free.
Vatta,.....			U — —				U — —	
Pathyāvatta,.....			U — —				U — U	
Viparītapathyāvatta,			U — U				U — —	
Capalāvatta,			U U U				U — —	
Vipulā of Piṅgala,			U — —				U — U	
Vipulā of Śeṭava,			U — U					
Bha-vipulā,			— U U					
Ra-vipulā,			— U —					
Na-vipulā,.....			U U U					
Ta-vipulā,			— — U					.

Notes on Chapter 6.

.. * This chapter enters into the solution of the six problems, (*cha-ppaccaya*) which are as follows:—

1. To distribute in the form of a table the different quantities in the possible variations of a metre.
2. To determine the structure of a variation, the row number of which is known.
3. To determine the row number of a variation, the structure of which is known.
4. To determine the number of those variations which respectively contain no long quantities, or one long, or two long, and so on.
5. To determine the number of the possible variations of a metre.
6. To determine the space requisite for writing down the possible variations of a metre.

v. 128. *te ca-m-ime*; And these; (three alternations (*vikappā*) being understood). This is the reading of the Burmese *MSS*. “*te ca ime tayo vidhiyo yāva sabbalāhu go pādo, tāva kattabbo.*” *Vac.* “*puna lahuto pubbe garu te ca ime tayo vidhiyo sabbalā sabbalahupādā katabham*; *athavā × × tato lahuto, garu pubbe pubbat-hāne yeva pare panakkharā upari sadisā yevāty attho, evam ime akkharā kattabbi, yāva sabbalā sabbalahupādassa avasānanti, imas-min ca vikappe “garutevaṃime” ti paṭho “garu iti evam ime “ti chedo” Kae.*

This verse describes the mode of arranging in a table, the distribution of the long and short quantities in the possible variations of a metre.

According to the rule all long quantities are set down in the first row, in each succeeding row, a short quantity must first be placed beneath the first long of the row above; to the *right* of such short quantity, must be written quantities similar to those in the row above; to the *left* of such short quantity, as many long quantities as may be required to fill up the row; and so on until a row of all short quantities is formed. Thus a metre, whose quarter verse consists of one foot, has two variations, a quarter with two, four variations, and a quarter with three feet, eight variations, and so on, the variations increasing in geometrical proportion, as the quarter verse increases in length.

Row number.	The number of variations in a metre having three syllables in a each quarter verse.		
1	—	—	—
2	—	—	—
3	—	—	—
4	—	—	—
5	—	—	—
6	—	—	—
7	—	—	—
8	—	—	—

v. 129. This rule determines the structure of a variation in the table, the row number of which is known. The *Gāyattī* has quarters of six syllables, let the structure of the tenth row be determined.

as 10 can be halved set down a breve	✓
as 5 without an additional unit cannot be halved set down a long,	—
as 3 an odd number requires a unit set down a long,	—
as 2 can be halved set down a breve.	✓
as 1 being an odd number requires a unit set down a long,	—
as 1 again requires a unit set down a long,	—

The structure, then, of the 10th row of the *Gáyatti* is ✓ — — ✓ — —

- v. 130. This rule is the converse of the preceding. Given the structure, to determine the row number. Let ✓ — — ✓ — — be taken as the structure of a variation in a metre having quarters of six syllables. Commencing at the first syllable place under each syllable, numbers in geometrical progression from one, thus :

✓ — — ✓ — — }
1 2 4 8 16 32 ; } the sum of the numbers beneath the short syllables *plus* one, gives the row number, *e. g.* : $1 + 8 + 1 = 10$; and we have just seen that this structure corresponds with the 10th variation of the *Gáyatti*.

- v. 131. This rule determines the number of variations containing no long quantity, or one long, or two longs, or all longs. Units are to be placed, vertically one over the other, in succession equal to the number of syllables the metre has in each quarter *plus* one ; thus the *Gáyatti* having six syllables, seven units are set down vertically one over the other ; each succeeding column must be one less in number than the one preceding it ; in each of the columns succeeding the first (which all commence with a unit) there is a rising, and in this fashion : after writing the first unit of each column, each following number must be the sum of the number immediately to its left in the preceding column *plus* all those below that said number ; *e. g.*, in the third column, 3 follows the unit being the sum of $2 + 1$ of the preceding column, then follows 6 being the sum of $3 + 2 + 1$, and so on, as in the subjoined table.

- | | |
|---|--|
| 1 | one row with all long quantities. |
| 1 | 6 six rows with five longs. |
| 1 | 5 15 fifteen rows with four longs. |
| 1 | 4 10 20 twenty rows with three longs. |
| 1 | 3 6 10 15 fifteen rows with two longs. |
| 1 | 2 3 4 5 6 six rows with one long. |
| 1 | 1 1 1 1 1 1 one row with no long quantity. |

- v. 132. *vemam* for *vá inam*.

The number of the possible variations of a metre may be determined either, (a) by adding together the top numbers of the columns as shown in the preceding rule, or (b) by adding together the numbers placed beneath the short quantities *plus* one, according to the rule in v. 130, *e. g.* :

$$(a.) \quad 1 + 6 + 15 + 20 + 15 + 6 + 1 \dots \dots \dots = 64$$

$$(b.) \quad \cup \cup \cup \cup \cup \cup \cup \quad 1 + 2 + 4 + 8 + 16 + 32 + 1 = 64$$

$$1 \quad 2 \quad 4 \quad 8 \quad 16 \quad 32$$

Thus 64 is the number of the possible variations of the Gáyatti metre of six syllables in each quarter.

v. 133. This rule lays down the space in inches, that is required for writing down the quantities in the several variations. The inches required must be double the number of variations *minus* one, thus the Gáyatti having 64 variations would require for each quarter verse $64 + 64 = 128 - 1$, or 127 inches.

v. 134. *Síla Thera*. Moggallána. The author of this treatise was a disciple of Sáríputta, otherwise called Síla Thera.

Rhyming metres find no place in this work; reference, however, is made to a kind of word-repetition termed *yamaka* in the author's *Subodhálankára* (*Easy Rhetoric*), vv. 26 to 52.* This kind of word-rhyming or word-matching is twofold—

(a) isolate, (*vyapeta*).

(b) corporate (*avyapeta*).

and has many varied combinations, either kind being found separately, or in conjunction, anywhere in the stanza.

Besides the instances given in the *Subodhálankára*, vv. 28—31, the *Ũíká* of that treatise gives six stanzas wherein the subjoined words in italics, occur in the same place in each line of their respective stanzas. For brevity's sake, one line only of each stanza is here given.

1. *manam manam* satthu dadeyya ceyya.
2. *yato na tena te* pito siyum *na tena te* subhá.
3. *vencyyenettha* guṇa *sajjanam janam*.
4. *sabháya sabhati* na ce kathaṃ na.
5. *nabhásura* te pi *surá* vibhúsitá.
6. *jinánattiyam ye* *hitásá* *sitáedá*.

* J. A. S. B., Part 1, No. 2, 1875, pp. 96.

Contributions to the explanation of the Jyotisha Vedāṅga.—By
G. THIBAUT, PH. DR.

The small metrical treatise known by the name of the Jyotisha-vedāṅga has attracted the attention of scholars since the first time when Sanskrit literature began to be studied by Europeans. Especially it was the celebrated verses containing a statement regarding the place of the winter-solstice at some ancient, although as it finally has turned out, rather indefinite period, which gave rise to a good deal of comment and speculation. They have been discussed in all their bearings by Sir W. Jones, Colebrooke, Bentley, Davis in the beginning of this century, and were submitted at a more recent period to renewed investigation; it may suffice to refer to Prof. A. Weber's papers on the nakshatras (especially the second one, p. 355), Prof. M. Müller's preface to the fourth volume of his large edition of the Rik-saṃhitā, which moreover contains some calculations by Archbishop Pratt and Prof. W. F. Donkin, and the important paper by Prof. Whitney in the first volume (new series) of the Journal of the Royal Asiatic Society of Great Britain, the substance of which is reproduced in the twelfth essay, second series, of his "Oriental and Linguistic Studies." These verses about the places of the winter-solstice, bearing as they do on the question of the chronology of Vedic literature, certainly are the most important of the whole treatise, and may justly claim a much larger amount of interest than we can accord to the remainder of the Jyotisha; nevertheless the Jyotisha being avowedly the oldest Indian work referring to astronomy which has come down to our time, it was highly desirable that we should be enabled, by a publication of the entire work, to judge of its value. This was at last rendered possible by the paper of Prof. A. Weber "Ueber den Vedakalender, Namens Jyotishaṃ" published in the transactions of the Royal Academy of Sciences at Berlin, 1862; which contains an edition of the complete text based on the comparison of a great number of manuscripts, the gloss on the text by Somākara, a translation of the text which is founded on Somākara's explanations as far as these owing to the exceptionally bad state of the manuscripts could be made out, and a very instructive commentary by Prof. Weber himself, in which there is collected a large amount of material from divers sources tending to the elucidation of the obscure verses of the Jyotisha. But in spite of the important step in advance made in Prof. Weber's edition, there remains, as he has himself acknowledged, much to be done before we can claim fully to understand the Jyotisha. The first obstacle in our way is of course the style of the treatise itself with its enigmatical shortness of expression, its strange archaic forms and its utter want of connexion between the single verses. The second ob-

stacle is, or I should rather be inclined to say, was the extraordinary corruption of all the manuscripts containing Somákara's commentary, a corruption extending so far that in more than one passage it is hardly possible to make out even the general drift of the argument (I myself have been able to procure three MSS. in addition to those used by Prof. Weber, but they belong to the same families as his and no additional advantage is to be derived from them). The reason for which I prefer to call this second obstacle a past one lies in my conviction of Somákara's commentary being not only of slight value, but, the explanations of a few verses excepted, positively harmful as misleading the student of the Jyotisha and preventing him from having recourse to the only legitimate method of arriving at its true meaning. In fact I consider Somákara to have totally misunderstood by far the greater part of the few rules of which the Jyotisha consists. Professor Weber already, in his edition of the Jyotisha, has complained in many places, of the want of connexion by which Somákara's method of interpretation is characterized and of the strangeness of the results at which we frequently arrive when accepting him for our guide ; but I think we may safely go a step farther and, instead of regretting the want of ability on our side to construe Somákara's explanations into a consistent whole, reject his explanations just for the very reason that we are unable to elicit a satisfactory sense from them. It appears to me that Somákara has grasped the meaning of his text only where it either was impossible to misunderstand it (so f. e. in the introductory verses) or where corresponding passages of the Gárgi Samhitá assisted him in making out the right meaning (so f. e. v. 9, 10). In these latter cases his gloss certainly has some value, since those parts of Garga's work from which he quotes appear to be lost, or have at any rate not been recovered up to the present time ; but with regard to the whole remainder of the Jyotisha—and this remainder forms by far the greater part of the work—his commentary must be declared to be worse than useless. The chief objection to Somákara's manner of commenting—an objection which by itself would be sufficient to condemn it—is the complete absence of anything in the way of "upapatti" or proof. While every good commentary on an Indian astronomical work, after having explained one of the rules given in the text proceeds to justify it by showing its agreement with the general principles of the system, Somákara never makes such an attempt ; he simply gives a scanty explanation of the words of the text and then leaves the reader to his own resources. And the explanations which he gives are for the greater part of a very strange nature indeed. Later on, the true explanation of a few passages of the Jyotisha will be given, when Somákara's mistakes with reference to these will clearly appear from a mere comparison ; I now direct the reader's attention to some verses the right sense of which

I am indeed unable to point out, but where nevertheless Romākara's want of understanding is patent. At first however I reprint the text of the Jyotisha, only for convenience's sake, since frequent references to it will be made in the following pages, not with the intention to give it in a purer form than that known up to the present time. A few corrections of the traditional text will be given later on ; the necessary critical apparatus for the restitution of those verses which are manifestly corrupt, and for which I am unable to propose emendations, will be found in Prof. Weber's edition. I consider it superfluous to reprint here the different readings of the MSS. ; the verses of the Jyotisha are for the greater part of such a nature that the restitution of the single words of the original text can only be accomplished after we have found out by some other means the probable sense of the whole verse. I follow the arrangement of Prof. Weber's edition giving at first those verses which are found in the recension connected with the Yajurveda and then adding those which belong to the Rik recension only.

पञ्चसंवत्सरमयं युगाध्यक्षं प्रजापतिम् ।

दिनवर्त्यनमासाङ्गं प्रणम्य शिरसा शुचिः ॥ १ ॥

ज्योतिषामयनं पुण्यं प्रवक्ष्याम्यनुपूर्वशः ।

ब्राह्मणेन्द्राणां संमतं यज्ञकालार्थसिद्धये ॥ २ ॥

वेदा हि यज्ञार्थमभिप्रवृत्ताः कालानुपूर्व्यां विहिताश्च यज्ञाः ।

तस्मादिदं कालविज्ञानमालं यो ज्योतिषं वेद स वेद यज्ञसम् ॥ ३ ॥

यथा भिक्षा मयूराणां नागानां मणयो यथा ।

तद्वद्देवाङ्गशास्त्राणां गणितं भूर्धनि स्थितम् ॥ ४ ॥

माघशुक्लप्रपञ्चस्य पौषकृष्णसमापिनः ।

युगस्य पञ्चवर्षस्य कालज्ञानं प्रवक्षते ॥ ५ ॥

क्षराक्रमेते सोमार्का यदा साकं सवासवौ ।

स्यात्तदादि युगं माघशुक्लः शुक्लोऽयनं शुद्धम् ॥ ६ ॥

प्रपद्येते अविष्टादौ सूर्याचन्द्रमसावुदक् ।

सार्धार्धे दक्षिणाऽर्कसु माघश्रावणयोः सदा ॥ ७ ॥

वर्गद्वयद्विपर्यासः क्षपाद्वास उदयतौ ।

दक्षिणेतौ विपर्यासः षण्मुहूर्त्ययनेन तु ॥ ८ ॥

प्रथमं सप्तमं चाक्षरयनाथं त्रयोदशम् ।

चतुर्थं दशमं चैव द्वियुगाथं बहुलोप्यतौ ॥ ९ ॥

वसुस्तथा भवोऽजय मित्रः सर्पोऽश्विनौ जलम् ।

धाता कश्यपाय्याः स्युरर्धपञ्चमस्तुतुः ॥ १० ॥

इकान्तरेऽपि माघे च पूर्वाश्रमादिप्रकारः ।

वर्षयोः पञ्चपर्वाणां कष्टं पञ्चदशमाह्वये ॥ ११ ॥

दुर्धनं पर्वं चेत्यादे पादलिङ्गानु संज्ञिका ।

भागात्मनापद्यन्त्याऽपि हि हिमदधिको यदि ॥ १९ ॥
 निरेके द्वादशभ्यस्तद्दिगुर्ध्वं चाऽयसंयुतम् ।
 षट्ठा षट्ठा युतं द्वाभ्यां पर्वणां रात्रिरप्यते ॥ १९ ॥
 स्युः पादोऽर्धं त्रिपदायास्त्रिद्वयोऽङ्गः द्यते स्थितिम् ।
 सान्येमेन्दोः सृणोऽन्ये तु पञ्चकाः पर्वसंमिताः ॥ १४ ॥
 भांशाः स्युरष्टकाः कार्याः पञ्चा द्वादशकोद्धताः ।
 एकादशगुणस्थानः श्रुतोऽर्धं चैन्दवा यदि ॥ १५ ॥
 नवकैरुद्धताऽंशः स्याद्भूतः सप्तगुणो भवेत् ।
 आवापस्त्युज्ये द्वौ स्यात्पेलस्त्येऽस्तगतोपरम् ॥ १६ ॥
 आवाद्यंशः सप्तं विद्यात्यूर्वाधं पर्वस्तृतराः ।
 भादानं स्याच्चतुर्दशं द्विभागेभ्योऽधिको यदि ॥ १७ ॥
 जौ द्वा गः खे खे ही रो वा चिन् मू ष ण्यः सु मा घा णः ।
 रे ऋ वा खा पो जः छ ष्य च ज्ये छ इत्युच्चा लिङ्गैः ॥ १८ ॥
 कार्या भांशाऽष्टकाः स्थाने कला एकात्रविंशतिः ।
 जनस्थाने द्विसप्ततिमुद्वपेद्युक्तसंभवे ॥ १९ ॥
 तिथिमेकादशाभ्यस्तां पर्वभांशसमन्विताम् ।
 विभज्य भसमूहेन तिथिनक्षत्रमादिशेत् ॥ २० ॥
 याः पर्वभादानकलास्त्रास्तु सप्तगुणां तिथिम् ।
 उक्तास्त्रास्तां विजानीयात् तिथिभादानिकाः कलाः ॥ २१ ॥
 अतीतपर्वभागेभ्यः शोधयेद् द्विगुणां तिथिम् ।
 तेषु सण्डलभागेषु तिथिनिष्ठां गता रविः ॥ २२ ॥
 विषुवर्त्तं द्विरभ्यस्तं रूपानं षड्गुणीकृतम् ।
 पञ्चा यदर्थं पञ्चाणां तिथिः स विषुवान् स्मृतः ॥ २३ ॥
 पलाणि पञ्चाशदपां धृतानि तदाढकं द्रोणमतः प्रमेयम् ।
 निभिविचीनं कुडवैस्तु कार्यं तन्नाडिकायास्तु भवेत्प्रमाणम् ॥ २४ ॥
 एकादशभिरभ्यस्य पर्वणि नवभिस्त्रिथिम् ।
 युगलब्धं सपर्वं स्याद्वर्तमानार्कभक्तमात् ॥ २५ ॥
 सूर्यर्क्षभागान्नवभिर्विभज्य श्रेष्ठं द्विरभ्यस्य दिनोपभुक्तिः ।
 तिथियुता भुक्तिर्दिनेषु कालो योगं दिनैकादशकेन तद्वत् ॥ २६ ॥
 ज्यंशो भवेद्यो दिवसांशभागस्तुर्दशयापनीय भिन्नम् ।
 भासऽधिके चाऽपि गते परोऽंशे द्वावुत्तमे तं नवकै रवेद्या ॥ २७ ॥
 निश्रत्यर्का सप्तद्विष्टिरब्दः षट् चर्तवोऽयने ।
 मासा द्वादश सूर्याः स्युरेतत्पञ्चगुणं युगम् ॥ २८ ॥
 उदया नासवस्तु सूर्योदितरात्रिः सप्तपञ्चकः ।
 ऋषेर्द्विषड्विधीनं स्याद्विहृत्या चैकया सुप्तम् ॥ २९ ॥
 पञ्चविंशं वर्तते प्रियमैकेनैकमयमायुके ।
 पर्वणां स्याच्चतुर्धादी काष्ठानां चैव ताः कलाः ॥ ३० ॥

सावनेन्दुस्त्रिमासानां षष्टिः सैकद्विसप्तिकाः ।
 द्वि चिंशत्सावनस्याऽर्धेः सूर्येणुषां सपर्ययः ॥ ११ ॥
 अग्निः प्रजापतिः सोमो ब्रह्माऽदितिर्बृहस्पतिः ।
 सर्पाश्च पितरश्चैव भगवैवार्थमाऽपि च ॥ १२ ॥
 सविता त्वष्टाऽथ वायुश्चैन्द्राग्नी मित्र एव च ।
 इन्द्रो निर्वृत्तिरापो वै विश्वे देवास्तथैव च ॥ १३ ॥
 विष्णुर्वसवो वरुणोऽश्विर्बुध्रास्तथैव च ।
 अज एकपातया पूषा अश्विनौ यम एव च ॥ १४ ॥
 नक्षत्रदेवता ह्येता एताभिर्यज्ञकर्मणि ।
 यजमानस्य शास्त्रज्ञैर्नाम नक्षत्रजं स्मृतम् ॥ १५ ॥
 उषाण्यार्द्रा च चित्रा च विशाखा श्रवणोऽश्चयुक् ।
 मूराणि तु मघा स्वातिश्चैष्टा मूलं यमस्य यत् ॥ १६ ॥
 ध्रुवं द्विषष्टिभागेन ज्येष्ठं सूर्यात्सप्तार्धेणम् ।
 यत्कृतावुपजायेते मध्येऽन्ते चाऽधिसप्तको ॥ १७ ॥
 कला दश सर्विशा स्याद् द्वे मुहूर्तस्य नाडिके ।
 द्वि चिंशत्कलानां तु षट्शती त्र्यधिका भवेत् ॥ १८ ॥
 सप्तमकं भयुक्सोमः सूर्यो द्युनि त्रयोदश ।
 उत्तमानि तु पञ्चाङ्गः काष्ठा पञ्चाक्षरा भवेत् ॥ १९ ॥
 यदुत्तरस्यायनतो गतं स्याच्छेषं तथा दक्षिणतोऽयनस्य ।
 तदेव षष्ट्या द्विगुणं विभक्तं सदादशं स्याद् दिवसप्रमाणम् ॥ ४० ॥
 यदधं दिनभागानां सदा पर्वणि पर्वणि ।
 ऋतुर्ग्रेषं तु तद्विद्यात्संख्याय सच्च पर्वणाम् ॥ ४१ ॥
 इत्युपायसमुद्देशो भूयोऽप्यङ्गः प्रकल्पयेत् ।
 ज्येष्ठराशिगतान् व्यस्तान्विभजेज् ज्ञानराशिना ॥ ४२ ॥
 सोमसूर्यस्त्रिचरितं विद्वान्वेदविद्वद्भुते ।
 सोमसूर्यस्त्रिचरितं लोकं लोके च संततिम् ॥ ४३ ॥

प्रथम्य शिरसा कालमभिवाद्य सरस्वतीम् ।
 कालज्ञानं प्रवक्ष्यामि लग्नस्य महात्मनः ॥ १ ॥
 पश्चात्पञ्चदशाशेषं तद्भुक्तमिति निर्दिशेत् ।
 नवमिस्तूह्यतोऽंशः स्याद्भुक्तान्शद्विधेन तु ॥ २ ॥
 नाडिके द्वे मुहूर्तस्तु पञ्चाशत्यक्षं माषकम् ।
 माषकान्कुम्भको द्वाणः कुट्टपैर्वर्षते त्रिभिः ॥ ३ ॥
 अविष्टाभ्यां गुणाभ्यस्तान्प्रान्तिस्तान्निर्दिशेत् ।
 सूर्यान्मासां च लग्नस्य चान्तिस्तान्निर्दिशेत् ॥ ४ ॥
 ऋतूनां नवमीं चैव पौर्णमासीं चोदसीम् ।
 षष्ठीं च विषवाग्नेतो द्वादश्यां च संततिम् ॥ ५ ॥

चतुर्दशीमुपवस्यन्त्या भवेत् यथोद्दिष्टो दिनमुपैति चन्द्रमाः ।
 नावमुत्क्रान्तिवो बुद्धेः पञ्चदश्या च वार्षिकीन् ॥ ६ ॥

I now shall point out some of Somákara's manifestly mistaken explanations alluded to above (the full text of S. will be found in Prof. Weber's edition). V. 21 he explains as stating the length of a tithi; but then a tithi would consist of fifty-six nádikás only, which duration is much too short (it is of course well known that a tithi in consequence of hrása actually may have that duration; but the knowledge of tithi-vṛddhi and tithi-hrása with the reasons on which they depend, is foreign to the Jyotisha). V. 13. According to Somákara's explanation the words of this verse would imply that the length of the holy time at púrnamásí which may be employed for sacrifices amounts to 138 nádikás in case of the parvan taking place in a chaturaná nakshatra *i. e.*, a nakshatra consisting of four parts. But according to all authorities, and their number is a very great one, that part of the parvan-time which is fit for the offering of the sacrifice, includes only the fifteenth tithi of a paksha and three quarters of the immediately following pratipad, altogether seven quarters of a tithi, while 138 nádikás exceed even two sávana days by eighteen nádikás. V. 14 would, according to Somákara, imply that the last quarter of the fifteenth tithi of a paksha may be used for upavása, *i. e.*, the initiatory rites preceding the performance of the sacrifice; but all teachers are unanimous in assigning to upavása only the three first quarters of panchadaśí (noticed already by Prof. Weber, p. 54). Of v. 20 Somákara gives two wholly different explanations, both equally unsatisfactory and one stultifying the other; the same observation is to be made regarding his interpretation of v. 25. And so throughout the whole commentary. Certainly S. has been unable to throw any light on the most obscure point in the Jyotisha, a point which I regret to say has remained obscure to me also, *viz.* the true meaning and purport of the anśas or parts which are said to belong to the nakshatras and according to the participation in which each individual nakshatra is either dvyanśa or tryanśa or chaturanśa. S. understands these parts as meant to fix the length of that period at each parvan which admits of being occupied by the parvan-sacrifice and its preparations, but as we have seen above, the results to which this assumption leads him flatly contradict whatever is known about that point from other sources of undisputable authority. I for my part doubt if the anśas are in any way connected with the time taken up by the new and full moon oblations, all the more as not a single word in the whole text of the Jyotisha directly points to such a conclusion (the only exception occurs in one of the verses, marked above v. 6—which are found in the Rik-recension only; there we read the word

"upavasatha"). Being, however, unable to replace Somākhara's explanation by a better one, I should not wish to express more than a doubt.

I now proceed to point out the right meaning of some verses which have not been understood up to the present, preparing my way by shortly recapitulating the fundamental doctrines of the Jyotisha.

The author of the Jyotisha intends to propound in his treatise the doctrine of the cycle consisting of five years. V. 5 :

"They teach (in this treatise) the knowledge of the time of the cycle consisting of five years which begins with the white half of the month Māgha and terminates with the dark half of the month Pausa."

Compare also v. 1 :

"Prajāpati, the lord of the cycle, him who consists of five years, &c."

The first question presenting itself, *viz.* the question about the nature of the year which constitutes the fifth part of the yuga, is answered in v. 28 :

"Three hundred and sixty-six days, one year, six seasons, two *ayanās* (the northern and the southern progress of the sun), twelve months are to be considered as solar ; this taken five times is a cycle."

The year meant is therefore the tropical solar year (of course I do not wish to intimate thereby that the author of the Jyotisha was able to distinguish between the sidereal solar year and the tropical solar year). I add Garga's description of the same year as quoted by Somākhara in his comment on v. 11 of the Jyotisha :

सौर्ये सूर्यात् सभूतं परिसर्पति भास्करे ।
 यावन्ता स्युतरा काष्ठा गत्वा गच्छति दक्षिणाम् ॥
 कालेन सौऽब्दस्यार्धमयनं तु त्रयोऽर्धवः ।
 ऋतोरर्धं भवेन्नामलिंशद्भागदिनोऽर्कजः ॥
 तस्यार्धमर्कजः पक्षस्यैव सप्तदशं दिनम् ।
 शतं लवाना पञ्चविंशं लवः पक्षदशलथा ॥
 — — अष्टादशशतं युगमाकौदनैः स्युतम् ।

The above translated verse of the Jyotisha and this passage of Garga clearly refer to the same kind of year. There appears at first sight to be a difference in their way of subdividing the year, Garga making it to consist of 360 days, while the Jyotisha attributes to it 366. But this is only apparent. The day of which Garga speaks is the solar day of Indian astronomy, *i. e.*, simply the three hundred and sixtieth part of a solar year, no account being taken of the natural succession of day and night. Garga had, before he defined the solar measure, described the *sāvāna* measure and remarked that one yuga consists of 1,830 *sāvāna* days ; he could therefore afterwards adopt any subdivision of the solar year without the risk of being misunderstood. The Jyotisha, on the other hand not having stated, before

how many *sávana* days there are in a *yuga*, had, when basing its *yuga* on the solar year, to explain how many natural days there are contained in the latter. We shall see that the *yuga* is divided besides into years of a different kind, namely, three lunar years consisting of twelve lunations each, and two lunar years consisting of thirteen lunations each. This division is that actually made use of in the course of the work, but it is of course only a secondary division originating from the wish of establishing an equation between solar and lunar revolutions. The knowledge of the solar year of 366 days, or of the sun's tropical revolution being accomplished in about 366 days, forms the necessary presupposition not only for the *yuga* of the *Jyotisha* and *Garga* with its two intercalary lunar months, but also for the ancient *vedic* quinquennial *yuga* with its one intercalary (*sávana*) month. I can therefore not agree with Prof. Weber when he supposes (p. 12) this solar year to be an importation from some foreign country. Both *yugas*, the *vedic* as well as that of the *Jyotisha*, would never have been formed, but for the knowledge of the difference of five years of 360 days and of sixty lunations from the time during which the sun performs five tropical revolutions, and for the resulting wish to make up for the wanting harmony.

To return to the *Jyotisha*. The length of the solar year being defined and five years being set down as one *yuga*, the next question presenting itself is for what reason just this number of years is combined into a cycle.

V. 31, first half :

“There are (in one *yuga*) sixty-one *sávana* months, sixty-two lunar months, sixty-seven *nákshatra* months.”

I. e. While the sun accomplishes five tropical revolutions, the moon accomplishes sixty-two synodical and sixty-seven periodical revolutions, and the whole period comprises sixty-one *sávana* months of 30 natural days each.

I again subjoin the fuller statements of *Garga* ; first, regarding the *sávana* measure :

अहोरात्रात्मकं लौक्यं मानं च सावनं स्मृतम् ।
 अतश्चैतानि मानानि प्रकृतानीह सावनात् ॥
 ततः सिद्धान्यहोरात्राण्युदयास्राव्यार्कजाः ।
 त्रिंशच्चाष्टादशमृतं दिनानां च युगे स्मृतम् ॥
 मासस्त्रिंशदहोरात्रः पञ्चोऽर्थं सावनं स्मृतम् ।
 अहोरात्रं खगानां तु चतुर्विंशत्तात्मकम् ॥

Regarding the lunar measure :

इद्विंशत्यायां संभूतं चान्द्रं मानं हि चन्द्रतः ।
 सप्तं खगमयाज्ज्ञेयं सावनेन त्रिंशद्वारः ॥

चयं दृष्टिमवाप्नोति स चान्द्रो मास उच्यते ।
 तस्यार्धे पार्वकः पञ्चसप्तत्यात्यक्षदशी तिथिः ।
 प्रमाणेन खवानां तु द्वादशं भूतमुच्यते ।
 सोमस्याष्टादशशती युगे षड्यधिका क्षृता ॥

And about the nákshatra-measure :

यावता खेव काशेन भवगे विणवात्मकम् ।
 भुङ्क्ते इन्द्रः स चार्चो मासस्यार्धे पञ्च उच्यते ॥
 चार्चोऽत्यक्षात्यक्षदशं नाक्षत्रं दिनमुच्यते ।
 प्रमाणेन खवानां तु द्वादशं भूतमुच्यते ॥
 सप्तसप्तषष्ठितमांशेन चाक्ष्मात्यरो खः । *
 दशोत्तरं द्वे सप्तके युगमार्चैर्दिनैः क्षृतम् ॥

The next thing we want is a statement of the manner in which a day is subdivided. v. 38.

(A náḍiká) consists of ten and a twentieth kalás, a muhūrta comprises two náḍikás, a day has thirty (náḍikás) or six hundred and three kalás."

With this we have to combine the statement made in verse 30, that one kalá comprises one hundred and twenty-four káshṭhas and that made in v. 39, that one káshṭha consists of five aksharas.

The measure of the sávana day, expressed in kalás, is given already in v. 38; the length of the tithi expressed in the same measure amounts to $593 \frac{1}{2}$ (1830, the number of sávana days in a yuga being multiplied by 603, the number of kalás of one day, and the product being divided by 1860, the number of tithis in one yuga). The length of the nákshatra day,

* This verse is restored by conjecture only. The MSS. read : नाक्षासप्तषष्ठित-
 रजिनंचाक्षा० or : नाक्षासप्तषष्टातृशेजिनंचाक्ष्मात्य० Likewise they read in the preceding
 line : तु द्वाविंशं श० The latter has been emendated into द्वादशं by Prof. Weber
 already who remarks that द्वाविंशं is proved from calculation to be erroneous. This is
 quite true, but it does not go far enough, the length of a nákshatra day not being 112
 lavas but $112 + \frac{1}{2}$ lavas. The only thing which we may confidently look for even in
 the most ancient astronomical and mathematical works of India, is rigorous exactness in
 calculations of the above kind (a remark which we shall have to keep in eye in our at-
 tempts to reconstrue the meaning of the Jyotisha). Prof. Weber seems inclined to refer
 the सप्तषष्ठि of our verse to the number of the sidereal months in one yuga. These are
 sixty-seven indeed; but the mentioning of the number of the months, which can easily be
 deduced from the stated number of the days, is of much smaller importance than the
 accurate statement of the length of the day. Thus the number of the lunar months also
 is not expressly stated by Garga. The corruption of the verse in question being very
 great the above emendation is of course only one of many, we might adopt as far as the
 mere mode of expression is concerned; the sense would always have to be the same.

the thirtieth part of the *nákshatra* month = one periodical revolution of the moon, calculated in a corresponding manner, is 549 *kalás*. Let us now compare with this some of Somákara's statements. The first half of the obscure verse 21 : वा पर्वभादान० he explains as stating the measure of the *tithi* to be fifty-six *nádikás* (or 562 $\frac{1}{2}$ *kalás*) and the same sense he finds in the first *páda* of v. 39 : सप्तमं मयुक् सोमः, both explanations being founded on his supposing the number seven to mean seven certain divisions of time, which had been mentioned under the name of *bhánśáh*—parts of a constellation—in verse 15 and were said there to consist of eight parts or according to Somákara, eight *nádikás*. That Somákara's estimation of the duration of a *tithi* is much too short is manifest, and has been remarked by the editor of the *Jyotisha* already (p. 75) ; it is in contradiction not only with Garga's statements, as Prof. Weber notices, but with the elements of the *Jyotisha* itself. It might perhaps be imagined that this estimation refers not to the average *tithi* but a *tithi* which is shortened for some special reason ; but there is no mention made of such a shortening in any of the other verses of the *Jyotisha*. Leaving however v. 21 aside, we are able positively to show Somákara's mistake regarding v. 39. The words सप्तमं मयुक् सोमः he explains by स सोमः प्रकृतो मयुक् नक्षत्रचरितः सप्तमं सप्तमसंख्यां दिनं भुङ्क्ते इति वाक्यशेषः, according to which we should have to translate "the moon together with a *nakshatra* accomplishes a day consisting of seven parts (at 8 *nádikás* each)." Now firstly, the measure of a *tithi* having been fixed, according to Somákara, in v. 21 already, it would be utterly useless to repeat this statement here ; secondly, it does not appear why the conjunction of the moon with a *nakshatra* should be mentioned here, the *tithi* having nothing to do with that matter ; thirdly, सप्तमं cannot well mean "consisting of seven parts" but must be explained as "that which is joined with a septad." The right explanation is doubtless as follows : The periodical revolution of the moon is performed in $30 \times 549 = 16470$ *kalás* (see above) ; 16470 divided by 27, the number of the *nakshatras*, gives us 610 *kalás* as the time during which the moon remains in one *nakshatra*. Now 610 *kalás* exceed by 7 *kalás* the length of a (*sávana*) day which amounts to 603 *kalás*. We have therefore simply to supply a word for day (either from verse 38 Y or from the "dyúni" of the second *páda* of 39 ; (I prefer the latter, a different verse preceding v. 39 in the *Rik* recension) and to translate "the moon remains in a *nakshatra* for one day plus seven *kalás*." This translation is moreover demanded by the words immediately following : सूर्यो यूने चोदश्च उन्नयानि (R. नवमानि) तु पञ्चाङ्गः which undoubtedly state the length of the time during which the sun remains in one *nakshatra*. The reading of the *Rik* recension is clearly the right one ; for the sun passing through all 27 *nakshatras* in 366 days remains in one *nakshatra*

exactly 13½ days. The reading of Y. does not afford any satisfactory sense; it is interesting only as a proof of the heavy corruptions which the text of the Jyotisha has sustained. Somākara's explanation of "uttamāni" is, owing to the bad state of the MSS., unintelligible; but that it cannot have any value appears from his stating that the sun remains in one nakshatra thirteen days only.

I proceed at once to the verse which follows next in the Yajus recension, not because the matter it treats of is akin to that of verse 39, but because it contains a similar dangerous corruption and again illustrates Somākara's untrustworthiness. The verse runs as follows:

यदुत्तरस्यायनता गते स्याच्छेषं तथा दक्षिणतोऽयनस्य ।

तदेव षष्ट्या दिग्गुणं विभक्तं सद्वादशं स्यादिवसप्रमाणम् ॥

Somākara's commentary on this verse, as far as it can be made out, is as follows:

उत्तरायणादारभ्य यद्वर्तते स्यात् यावद्विषमजातमतीतं भवेत् शेषं तथा दक्षिणतोऽयनस्य । एवमेव दक्षिणायने शेषं विचारयेत् । तदेव षष्ट्या दिग्गुणं कुर्व्यादिति वाक्यशेषः । ततः षष्ट्या विभक्तं सद्वादशं स्याद् दिवसप्रमाणम् । एतदुक्तं भवति उदगयने चतुर्विंशतिनाडिका एवकाश (?) द्वाविंशतिदिनं भवति । ततो माघे गते विंशत्युदयस्य विंशद्दिग्गुणाः षष्ठिर्भवन्ति । ते च वर्षकालौष (?) षष्ठिर्घटिका भवन्ति । पञ्च माघे (?) पञ्चविंशतिनाडिका ते च द्वादश । एवमेव सद्वादशं स्यादिवसप्रमाणम् । एवमेतयैव कलमया हयोर्मासयोरन्ये ततोऽप्यधिके द्वे नाडिके क्षतिरिच्छन्ते । निष्पन्न्याश्लिषः । एवं विधुवति विंशद्नाडिका दिनं भवति । उत्तरेष्वेतेनैव सामक्रमणं द्वादशं कल्पयेत् ।

The verse clearly contains a rule for finding the relative length of day and night for any nycthemeron during the year. The elements for this calculation are given to us in the well-known verse of the Jyotisha, which fixes the length of the shortest and the longest day of the year (v. 8):

"The increase of the day and the decrease of the night during the northern progress of the sun is one prastha of water; the reverse is the case during the southern progress; a period of six muhūrtas (is the result) during one progress."

Therefore, the length of a nycthemeron being 30 muhūrtas (see above) the shortest day is twelve muhūrtas, the longest eighteen. Reasoning from these data only and not taking into account that in reality the day does not become longer by an equal portion at all times between the winter solstice and the summer solstice, we have the following simple calculation. The day increasing by six muhūrtas in one ayana = 183 days, it increases in one day by $\frac{6}{183} = \frac{2}{61}$ muhūrtas. Therefore, to find the length of any day between the winter solstice and the summer solstice, take the number of this day reckoning from the winter solstice and multiply it by two, divide the product by sixty-one and add the result to twelve, i. e., to the number of muhūrtas of the shortest day; the same rule applies to the days after the

summer solstice, only the process being presented as additive for all cases the number of the days has not to be reckoned from the past summer solstice, but from the coming winter solstice. From this it appears that we have to read in the second half of the verse तदेकषट्ठा instead of तदेव षट्ठा and to translate :

“What is passed of the northern progress and likewise what remains of the southern progress each (*viz.* the number of days in both cases) is to be multiplied by two, divided by sixty-one and added to twelve ; this is the measure of the day.”

I think it unnecessary to enter, after this, on a discussion of Somákara's explanation ; I only remark that here as in other cases he was probably prevented from seeing the right meaning of the rule by its very imperfection.

The estimation of the longest day at eighteen muhúrtas and of the shortest day at twelve muhúrtas, and the simple rule for finding the length of any day during the year appear to have generally prevailed in India, before the influence of Greek science began to make itself felt. We find them preserved in the Purāṇas, at a time when people very likely might have known better ; see, for instance, Wilson's Vishṇu Purāṇa, ed. by F. Hall, Vol. 2, p. 247. Likewise we meet with them in the chief astronomical treatise of the Jainas, the Súrappannatti or Súrapprajñapti, a summary of whose contents has been given by Prof. A. Weber in the tenth volume of the “Indische Studien”. There (pp. 264 ff.) the successive increase and decrease of the length of the day by $\frac{1}{4}$ muhúrtas is treated at length and explained according to the fundamental principles of the astronomical system of the Jainas.

I may add here at once, that an identical rule about the increase and decrease of the day is mentioned in Varáha Mihira's Pancha Siddhántiká as given by the Paitámaha Siddhánta. I subjoin in the following the whole passage referring to this Siddhánta as it is found in the only copy of the Pancha Siddhántiká which is known up to the present time—that one discovered by Dr. Bühler—without attempting to emendate the text which is just in that place particularly incorrect.

रविग्रहिणोः पञ्चयुगं वर्षाणि पितामहोपदिष्टानि ।

अधिसासिंश्रुर्गिरिवसासिषट्ठाका ॥ १ ॥

द्युम्नं शकेन्द्रकासं पञ्चविंशत्यशेषवर्षाणाम् ।

सुगुणं माघपितासं कुर्वोक्तसुगुणं तद्वैदधान् ॥ २ ॥

वर्षाण्येषसुगुणे तिथिर्भर्माकनवाक्षयेष्टके ।

दिग्गण्यमात्रैः सप्तमिहर्षं ग्रहिणं धनिष्टासम् ॥ ३ ॥

प्रागर्थे पर्व वक्ष्यते नक्षत्राणां तिथिः पूर्वा ।

वर्षार्थे चापि पितामहोपदिष्टा पञ्चम्वरं ज्ञताभिः ॥ ४ ॥

इतिरनवाधुनयो ह्यस्य गतस्यपि च साम्यम् । १० ।
 द्विगं ग्रहिरसमं ह्यद्वयं द्विगं द्विगं द्विगं ॥ ११ ॥
 इति पितानसिद्धान्ते ह्यद्वयं द्विगं ॥ १२ ॥

Although the above passage is so utterly corrupt that it hardly contains one sound word, any body familiar with the text of the Jyotisha Vedānga will not fail to observe that the astronomical book quoted by Varāha Mihira as Pitāmaha Siddhānta must have been either the Jyotisha itself or a work very much like it. The first of the above verses teaches that five years compose a luni-solar cycle and that to thirty months one intercalary month has to be added. In the second verse it is mentioned that the dyugana of the yuga begins with the light half of the month Māgha. In the third verse Dhanishthā seems to be named as the first of the nakshatras and the "saptabhir ūnam" possibly refers to the passage of the Jyotisha which has been treated above "sasaptakam bhayuk somah." The first pāda of the fourth verse may have to be read : प्राग्दे पर्व यदा तदेतत्ता and thus we should gain a parallel passage to the second pāda of v. 17 of the Jyotisha : पूर्वार्धे पर्वसूत्रता although the sense of both passages is obscure to me. On the other hand there is no doubt that the last verse contains the very same rule for calculating the length of a given day, which we have found in the Jyotisha. The posterior part of the first word we probably have to alter into रघनस्योनरता (or रघनादुत्तरता), corresponding to the उत्तरस्यायनता of the Jyotisha and to connect with गत while ह्यस्य has to be changed into ह्यद्वयं; in the second half-verse we have of course to read द्विगं ग्रहिरसमं. We may then translate—abstracting from an emendation of the second part of गतस्यपि which seems to contain some word expressing : day — : what has passed of the northern ayana, taken as positive (or additive ; सन्) and in the same way what has passed of the southern ayana, being taken as negative (or subtractive ; ऋणम्) is to be multiplied by two and divided by sixty-one ; the result is the measure of the day less twelve (i. e., twelve muhūrtas have to be added to the result in order to get the measure of the given day).

Regarding the disputed point whether the rule fixing the length of the shortest and longest days of the year has been borrowed by the Indians from some foreign source, for instance from Babylon, or sprung up independently on Indian soil, I am entirely of the opinion of Prof. Whitney who sees no sufficient reason for supposing the rule to be an imported one. It is true that the rule agrees with the facts only for the extreme north-west corner of India ; but it is approximately true for a much greater part of India, and that an ancient rule—which the rule in question doubtless is—agrees best with the actual circumstances existing in the North West of India is after all just what we should expect.

I proceed now to those verses which contain statements about the position of the moon at the different periods of the year. We have at first to consider v. 10.

बहुस्वदा भवेत्तस्य नि०

This verse contains an enumeration of the nakshatras (or rather of the divinities presiding over the nakshatras) in which the moon stands at the beginning of the ten ayanas of the yuga. The commentator quotes a long passage from Garga which contains the same statements expressed more lucidly and circumstantially, so that no doubt can remain about the real meaning of the verse. The ten nakshatras answering to the divinities enumerated are, according to vs. 32—34 of the Jyotisha: śravishthá, chitrá, árdrá, púrva proshthapadá, anurádha, áśleshá, ásvayuj, púrváshádhá, úttara-phálguní, rohini. The editor of the Jyotisha had, in his remarks on our verse (p. 33) expressed his desire of a competent person (*viz.* an astronomer) examining the statements made in it and ascertaining whether they agree with the actual state of the case. The wished for examination was, on the request of Prof. M. Müller, made by Prof. W. F. Donkin, and his note on the verse is appended to Prof. M. Muller's preface to the fourth volume of the large edition of the Rik-Samhitá. The question was, as it appears, hardly of such a nature as to require the skill of a professional mathematician and astronomer; at any rate before asking if the statements of the Jyotisha agree with reality, it ought simply to have been asked if they agree with or are deducible from the elements of the Jyotisha; if this is strictly the case, they will of course participate in the imperfections of these elements and cannot possibly be in perfect harmony with reality. Prof. Donkin naturally proceeded in this manner. Sixty-seven sidereal revolutions of the moon being considered equal to five solar years, one ayana is

equal to $6 \frac{1}{10}$ revolutions of the moon, or 6×27 nakshatras plus $\frac{27.7}{10} =$

$18 \frac{1}{10} = 18 \frac{1}{10}$ nakshatras. The moon is therefore at the end of each ayana 18 $\frac{1}{10}$ nakshatras in advance of the place she occupied at its beginning, and when examining the list of the twenty-seven nakshatras we find that her places calculated according to this rate of progress agree with the statements made in the Jyotisha and by Garga. As the Jyotisha only speaks of the nakshatras in general without stating in what points of them the moon is supposed to stand, there would seem to remain some space for irregularities in the moon's motion; but against such a supposition may be brought forward at least one of Garga's express statements, *viz.* that at the beginning of the third dakshináyana sun and moon stand together in the middle of áślesha (बभूवुश्च निषर्गोत्तम इत्यस्य प्रवर्गे तिथौ चन्द्रमौर्वीभां दुपन्ताभां चापार्श्वे); in the exact middle of that nakshatra the moon can only stand,

when the sum of her progress during the five preceding *ayanas* is equal to $5 \times 18 \frac{1}{6}$ *nakshatras*. And the fact of the sum of her progress at the end of each period of $2\frac{1}{4}$ years remaining always the same goes of course far to prove the supposed thorough uniformity of her progress; for what should be the inequalities which regularly disappear or destroy each other at the end of the stated period?

We may therefore assume that the author of the *Jyotisha* was either not acquainted with the irregularities of the course of the moon which are taken into account by the later Indian astronomers, *viz.* the irregularities produced by the position and the revolution of the line of apses of the sun and moon, or, at least did not make a practical use of them for his calculations. Keeping this in view, let us now consider a point which was undoubtedly of primary importance in the eyes of a *vedic* Astronomer, *viz.* the question in which points of the circle of the *nakshatras* full moon and new moon are taking place during the whole quinquennial cycle.

The *yuga* being assumed to contain 67 periodical lunar (*nákshatra*) months and 62 synodical lunar (*chándra*) months, one *chándra* month is equal to $\frac{67}{62} = 1 \frac{5}{62}$ *nákshatra* months. Consequently, the moon passing in one *nákshatra* month through 27 *nakshatras*, passes in one *chándra* month through $27 + \frac{5 \times 27}{62} = 29 \frac{11}{62}$ *nakshatras* and in one *paksha* (lunar half-month) through $14 \frac{13}{62}$ *nakshatras*. Full moon is therefore always separated from new moon and again new moon from full moon by the last mentioned quantity. On this ground I have drawn up the following list giving the places where all the hundred and twenty-four *parvans* (62 full moons and 62 new moons) of the *yuga* take place. It begins of course with the new moon marking the beginning of the *yuga*, which takes place at the beginning of *śravishthá* or end of *śravana*. The first column gives the new moons, the second one the full moons.

- | | |
|---|---|
| 1. $\frac{124}{124}$ <i>śravana</i> = $\frac{0}{124}$ <i>śravishthá</i> . | 1. $\frac{73}{124}$ <i>maghá</i> . |
| 2. $\frac{22}{124}$ <i>púrvabhádrap</i> . | 2. $\frac{95}{124}$ <i>uttaraphálg</i> . |
| 3. $\frac{44}{124}$ <i>revatí</i> . | 3. $\frac{117}{124}$ <i>chitrá</i> . |
| 4. $\frac{66}{124}$ <i>bharaní</i> . | 4. $\frac{15}{124}$ <i>anurádhá</i> . |
| 5. $\frac{88}{124}$ <i>rohiní</i> . | 5. $\frac{37}{124}$ <i>múla</i> . |
| 6. $\frac{110}{124}$ <i>árdrá</i> . | 6. $\frac{59}{124}$ <i>uttarāshádhá</i> . |

- | | |
|-------------------------------------|------------------------------------|
| 7. $\frac{8}{124}$ áśleshá. | 7. $\frac{81}{124}$ śravishṭhá. |
| 8. $\frac{30}{124}$ púrvaphálg. | 8. $\frac{103}{124}$ púrvabhádrap. |
| 9. $\frac{52}{124}$ hasta. | 9. $\frac{1}{124}$ áśviní. |
| 10. $\frac{74}{124}$ svátí. | 10. $\frac{23}{124}$ kṛittiká. |
| 11. $\frac{96}{124}$ anurádhá. | 11. $\frac{45}{124}$ mṛigaśiras. |
| 12. $\frac{118}{124}$ múla. | 12. $\frac{67}{124}$ punarvasu. |
| 13. $\frac{16}{124}$ śravaṇa. | 13. $\frac{89}{124}$ áśleshá. |
| 14. $\frac{38}{124}$ śatabhishaj. | 14. $\frac{111}{124}$ púrvaphálg. |
| 15. $\frac{60}{124}$ uttarabhádrap. | 15. $\frac{9}{124}$ chitrá. |
| 16. $\frac{82}{124}$ áśviní. | 16. $\frac{31}{124}$ viśákhá. |
| 17. $\frac{104}{124}$ kṛittiká. | 17. $\frac{53}{124}$ jyeshṭhá |
| 18. $\frac{2}{124}$ árdrá. | 18. $\frac{75}{124}$ púrváśháḍhá. |
| 19. $\frac{24}{124}$ pushya. | 19. $\frac{97}{124}$ śravaṇa. |
| 20. $\frac{46}{124}$ maghá. | 20. $\frac{119}{124}$ śatabhishaj. |
| 21. $\frac{68}{124}$ uttaraphálg. | 21. $\frac{17}{124}$ revatí. |
| 22. $\frac{90}{124}$ chitrá. | 22. $\frac{39}{124}$ bharaní. |
| 23. $\frac{112}{124}$ viśákhá. | 23. $\frac{61}{124}$ rohiní. |
| 24. $\frac{10}{124}$ múla. | 24. $\frac{83}{124}$ árdrá. |
| 25. $\frac{32}{124}$ uttaráśháḍhá. | 25. $\frac{105}{124}$ pushya. |
| 26. $\frac{54}{124}$ śravishṭhá. | 26. $\frac{8}{124}$ púrvaphálg. |
| 27. $\frac{76}{124}$ púrvabhádr. | 27. $\frac{25}{124}$ hasta. |

28.	$\frac{98}{124}$	revatí.	28.	$\frac{47}{124}$	svátí.
29.	$\frac{120}{124}$	bharaní.	29.	$\frac{69}{124}$	anurádhá.
30.	$\frac{18}{124}$	mṛigaśíras.	30.	$\frac{91}{124}$	múla.
31.	$\frac{40}{124}$	punarvasu.	31.	$\frac{113}{124}$	uttaráshádhá.
32.	$\frac{62}{124}$	ásleshá.	32.	$\frac{11}{124}$	śatabhishaj.
33.	$\frac{84}{124}$	púrvaphal.	33.	$\frac{33}{124}$	uttarabhádrap.
34.	$\frac{106}{124}$	hasta.	34.	$\frac{55}{124}$	ásviní.
35.	$\frac{4}{124}$	visúkhá.	35.	$\frac{77}{124}$	kṛittiká.
36.	$\frac{26}{124}$	jyeshthá.	36.	$\frac{99}{124}$	mṛigaśíras.
37.	$\frac{48}{124}$	púrváshádhá.	37.	$\frac{121}{124}$	punarvasu.
38.	$\frac{70}{124}$	śravaṇa.	38.	$\frac{19}{124}$	maghá.
39.	$\frac{92}{124}$	śatabhishaj.	39.	$\frac{41}{124}$	uttaraphálg.
40.	$\frac{114}{124}$	uttarabhdr.	40.	$\frac{63}{124}$	chitrá.
41.	$\frac{12}{124}$	bharaní.	41.	$\frac{85}{124}$	visúkhá.
42.	$\frac{34}{124}$	rohiṇí.	42.	$\frac{107}{124}$	jyeshthá.
43.	$\frac{56}{124}$	árdrá.	43.	$\frac{5}{124}$	uttaráshádhá.
44.	$\frac{78}{124}$	pushya.	44.	$\frac{27}{124}$	śravishthá.
45.	$\frac{100}{124}$	maghá.	45.	$\frac{49}{124}$	púrvabhádrap.
46.	$\frac{122}{124}$	uttaraphálg.	46.	$\frac{71}{124}$	revatí.
47.	$\frac{20}{124}$	svátí.	47.	$\frac{93}{124}$	bharaní.
48.	$\frac{42}{124}$	anurádhá.	48.	$\frac{115}{124}$	rohiṇí.

49. $\frac{64}{124}$ mūla.	49. $\frac{18}{124}$ punarvasu.
50. $\frac{86}{124}$ uttarābhādhā.	50. $\frac{35}{124}$ pūrvaphālg.
51. $\frac{108}{124}$ śravishthā.	51. $\frac{57}{124}$ pūrvaphālg.
52. $\frac{6}{124}$ uttarābhādrap.	52. $\frac{79}{124}$ hasta.
53. $\frac{28}{124}$ āśvinī.	53. $\frac{101}{124}$ svātī.
54. $\frac{50}{124}$ kṛittikā.	54. $\frac{123}{124}$ anurādhā.
55. $\frac{72}{124}$ mṛigaśīras.	55. $\frac{21}{124}$ pūrvābhādhā.
56. $\frac{94}{124}$ punarvasu.	56. $\frac{43}{124}$ śravaṇa.
57. $\frac{116}{124}$ āśleśhā.	57. $\frac{65}{124}$ śatabhishaj.*
58. $\frac{14}{124}$ uttaraphālg.	58. $\frac{87}{124}$ uttarābhādrap.
59. $\frac{36}{124}$ chitrā.	59. $\frac{109}{124}$ āśvinī.
60. $\frac{58}{124}$ viśākhā.	60. $\frac{1}{124}$ rohini.
61. $\frac{80}{124}$ jyeshthā.	61. $\frac{29}{124}$ ārdra.
62. $\frac{102}{124}$ pūrvābhādhā.	62. $\frac{51}{124}$ pushya.

Adding to the last full moon $14 \frac{13}{124}$, we get again $1 \frac{24}{124}$ śravaṇa, the first new moon of the next following yuga.

We must now look about if there can be found in the Jyotisha itself any traces indicating that its author acknowledged a list of the same nature as that given above. Our attention will naturally direct itself to the enigmatical eighteenth verse which according to the commentator contains an enumeration of the nakshatras in which a certain number of full moons take place. The twenty-seven disconnected syllables of which the verse consists are doubtless meant to represent the twenty-seven nakshatras, each syllable being taken either from the name of the nakshatra itself or from the name of the divinity presiding over it. The following is a list of the nakshatras arranged in the order implied in the verse :

1. āśvinī.	15. anurādhā.
2. ārdrā.	16. śravāṇa.
3. pūrvaphālg.	17. revatī.
4. viśākhā.	18. mṛgaśīras.
5. uttarāśādhā.	19. maghā.
6. uttarabhādrap.	20. svatī.
7. rohinī.	21. pūrvāśādhā.
8. āśleshā.	22. pūrvabhādrap.
9. chitrā.	23. kṛttikā.
10. mūla.	24. pushya.
11. śatabhishaj.	25. hasta.
12. bharanī.	26. jyeshthā.
13. punarvasu.	27. śravishthā.
14. uttaraphālg.	

For what purpose now are the twenty-seven nakshatras enumerated in the above order? Somākara's commentary on the verse is in all manuscripts so corrupt that it is impossible to give it in extenso or indeed even to make out its drift in many places; it is however apparent what was his view concerning the order of succession of the nakshatras. He supposes that the author of the Jyotisha intended to indicate in what nakshatras the full moons during the quinquennial cycle take place, but, instead of giving the nakshatras for all, only named those of every second full moon. Thus the six first mentioned nakshatras are said to represent six out of the twelve full moons of the first year, the five following ones five of the full moons of the second year, etc. Several of the difficulties arising from this explanation have already been pointed out by the editor of the Jyotisha; the most important is that the number of the full moons of a yuga is sixty-two or at least, if no account be taken of the two intercalary lunar months, sixty, and that we should therefore expect to see the nakshatras of at least thirty full moons stated. But there are other objections of a graver character. For if we compare the places of the full moons which would result from Somākara's explanation with the places as given in the list printed above, we find that they agree only for a part. The first full moon-nakshatra of Somākara, *viz.* āśvinī (āśvayujau), belonging to the month āśvina agrees with that given in the list (the ninth); but the second one does not agree, the full moon of the eleventh month mārgaśīrsha taking place not, as Somākara says, in ārdrā but in mṛgaśīras. In the same way the full moon of Phālguna takes place not in pūrvaphālgunī (bhaga) but in uttaraphālgunī; the full moon of vaiśākhā not in viśākhā but in anurādhā, and so on through the whole list. If somebody should object in favour of Somākara, that the fault of this discrepancy lies with my list, I should answer him that the *onus probandi* lies with him; the list is in strict accordance with the recog-

nised elements of the Jyotisha and as long as no other elements can be pointed out as having been overlooked by me, it must be considered valid. But in reality the list is not only not invalidated, but on the contrary corroborated by the very verse we are speaking of at present. The following short list will set the matter into a clear light :

The 9th full moon	takes place in	$\frac{1}{124}$	ásviní.
The 18th new moon	„ „ „	$\frac{2}{124}$	árdrá.
The 26th full moon	„ „ „	$\frac{3}{124}$	púrvaphálg.
The 35th new moon	„ „ „	$\frac{4}{124}$	visákhá.
The 43rd full moon	„ „ „	$\frac{5}{124}$	uttaráshádhá.
The 52nd new moon	„ „ „	$\frac{6}{124}$	uttarabhádrap.
The 60th full moon	„ „ „	$\frac{7}{124}$	rohini.
The 7th new moon	„ „ „	$\frac{8}{124}$	ásleśhá.
The 15th full moon	„ „ „	$\frac{9}{124}$	chitrá.
The 24th new moon	„ „ „	$\frac{10}{124}$	múla.
The 32nd full moon	„ „ „	$\frac{11}{124}$	śatabhishaj.
The 41st new moon	„ „ „	$\frac{12}{124}$	bharaní.
The 49th full moon	„ „ „	$\frac{13}{124}$	punarvasu.
The 58th new moon	„ „ „	$\frac{14}{124}$	uttaraphálg.
The 4th full moon	„ „ „	$\frac{15}{124}$	anurádhá.
The 13th new moon	„ „ „	$\frac{16}{124}$	śravana.
The 21st full moon	„ „ „	$\frac{17}{124}$	revatí.
The 30th new moon	„ „ „	$\frac{18}{124}$	mṛigaśíras.

The 38th full moon takes place in	$\frac{19}{124}$	maghā.
The 47th new moon " " "	$\frac{20}{124}$	svātī.
The 55th full moon, " " "	$\frac{21}{124}$	pūrvāśāḍhā.
The 2nd new moon " " "	$\frac{22}{124}$	pūrvabhādr.
The 10th full moon " " "	$\frac{23}{124}$	kṛittikā.
The 19th new moon " " "	$\frac{24}{124}$	pushya.
The 27th full moon " " "	$\frac{25}{124}$	hastā.
The 36th new moon " " "	$\frac{26}{124}$	jyeshthā.
The 44th full moon " " "	$\frac{27}{124}$	śrāviṣṭhā.

From comparing this list with the verse of the Jyotisha, the purport of the latter becomes manifest at once. The list begins with that nakshatra in the first one hundred and twenty-fourth part of which a parvan takes place, proceeds to that in the second $\frac{1}{24}$ of which the same takes place, and so on up to $\frac{27}{24}$, so that all nakshatras are comprised in the list. If we turn back to the complete list of all hundred and twenty-four parvans given above, we observe that all the numbers form regular progressions; it was therefore not difficult to lay down a simple rule, teaching at what place in a certain nakshatra parvans would take place after the place of the first parvan had been named. If such a rule is really hidden somewhere in the obscure verses of the Jyotisha, I am unable to say; possibly it might have been left to the ingenuity of the student to find out the required law. Nor am I able to explain by what principle the author of the Jyotisha was guided in selecting the syllables which represent the names of the twenty-seven nakshatras. Doubtless he had his good reasons for taking sometimes a syllable of the nakshatra's name, and sometimes a syllable of the name of the divinity presiding over the nakshatra, and again for taking either the first or the second or the third, etc., syllables of the names. Somākara's explanation is corrupt and obscure, and seems besides not entitled to much regard since, as shown above, he is utterly wrong regarding the order in which the nakshatras are enumerated. I will only remark that after it had been ascertained in what part of a nakshatra the parvan takes place, the next important point would have been to find out at what time of the day the half month is finished, for thereon depends the fixing of the time for the

darśapūrnāmāsa sacrifices. Possibly the selection of the syllables is connected with this point; I have, however, not succeeded in discovering the exact relation.

Prof. Weber raises the question (p. 69) if the verse explained above may be used for deciding whether the series of the nakshatras acknowledged by the author of the Jyotisha begins with Kṛittikā or with Āśvinī; the explanation given by me precludes of course the question entirely.

From the preceding considerations it appears that the author of the Jyotisha must have imagined each nakshatra as divided into one hundred and twenty-four parts. A further argument for this division as well as for a sub-division of the one hundred and twenty parts is to be drawn from the divisions of time which are made use of in the Jyotisha. These latter have been stated above; a nycthemeron is divided into thirty muhūrtas, a muhūrta into two nāḍikās, a nāḍikā into ten and a twentieth kalās, a kalā into one hundred and twenty-four káshthās, a káshthā into five aksharas. The great variety of sub-divisions of time employed in Indian astronomical works is well known, the only invariable element appears to have been the division of a day into thirty muhūrtas or sixty nāḍikās. Now, the system of sub-division of the nāḍikā being left to the choice of the individual astronomers they will naturally have selected those fractions of the nāḍikā which were to them of the comparatively greatest use in their calculations. What sub-divisions these are depends of course in each individual case on the celestial objects and motions which enter into the astronomer's calculations and on the view he takes of their relative importance. Thus we have seen above from Garga's exposition of the four measures of time that he divided the sávana day into one hundred and twenty-four lavas, consequently the nāḍikā (although the latter is not mentioned in the quoted extracts) into $2\frac{1}{3}$ lavas. This division enabled him to express the measure of the sávana day, of the tithi and of the solar day without using fractions, the first comprising, as stated, 124 lavas, the second 122, the third 126.* And the lava being sub-divided into fifteen parts (लवः पञ्चदशधा the name of this sub-division is not given) made it possible to express the measure of the nāḍikā without fractions. An analogous example is the division of one angula into thirty-four tilas, which occurs in Baudháyana's Śulvasūtra (see this Journal for 1875) and which enables us to express the relative length of the side and the diagonal of a square without making use of fractions. The same applies to the measures of time used in the Jyotisha. That quite a different value could be attached to the terms "kalā", "káshthā", etc., appears among other instances from the passage of Parásara quoted by Bhaṭṭotpala in his commentary on Varáhamihira's Bṛihat Samhitá, which is referred to by Prof. Weber (p. 105); according to it Parásara divided the nāḍikā into ten kalās, the kalā into ten káshthās, and the

kāshthā (omitting several intermediate divisions) into eighty nimeshas or aksharas. Other values are given to kalā, kāshthā, etc., in other places.

Now the Jyotisha begins with the apparently very inconvenient division of the nādikā into $10 \frac{1}{2}$ kalās. But this division, besides enabling us to express the duration of at least the sāvana and the nakshatra day in whole numbers (603 and 549), allows of our doing the same for the period during which the moon remains in one nakshatra, the length of which period is, as we have seen above, 610 kalās. This is of course of primary importance for a work of the character of the Jyotisha which chiefly treats of the moon's revolution through the circle of the nakshatras. Further we have seen that the nature of the quinquennial yuga necessarily led to the division of each nakshatra into one hundred and twenty-four parts; this division of space suggested in its turn a new division of time, viz. that of the kalā into one hundred and twenty-four kāshthās. The moon passing through one nakshatra in 610 kalās passes through its hundred twenty-fourth part in 610 kāshthās. At the same time the kāshthā helps us to a convenient expression for another period which is of first rate importance in the system of the Jyotisha, viz. that of the duration of a tithi, $593 \frac{1}{2}$ kalās being equal to 593 kalās, 34 kāshthās.

Considerations of a similar nature lead us to understand the use of the sub-division of the kāshthā into five aksharas. After having established divisions of space and time convenient for expressing the motion of the moon, others were wanted whereby to express the relation of her motion to that of the sun. The moon making sixty-seven revolutions while the sun makes five, the sun passes through $\frac{5}{67}$ of a nakshatra while the moon passes through a whole one. Now, in order to find an easy expression for this relation, the simplest method would of course have been to divide each nakshatra into sixty-seven parts; but this was no longer possible, the nakshatras being already, for more cogent reasons, divided into one hundred and twenty-four parts each. It was therefore necessary to look out for a sub-division of the one hundred and twenty-four parts of the nakshatra which would make a provision for the above stated want, and the first practicable sub-division which presented itself was that of each one hundred and twenty-fourth part into five parts or of the whole nakshatra into six hundred and twenty parts. For while the moon passes through sixty-seven out of the six hundred and twenty parts, the sun passes exactly through five of them. This sub-division of space again called for a corresponding sub-division of time, and thus the kāshthā was divided into five aksharas. The moon remains in a whole nakshatra 610 kalās, in $\frac{1}{14}$ of a nakshatra 610 kāshthās, in $\frac{1}{16}$ of a nakshatra 610 aksharas; 8174 kalās or kāshthās or aksharas would be the corresponding periods for the sun. Another important advantage of the division of a nakshatra in 620 parts was that it allowed of expressing in

whole numbers the space passed over by the moon during one tithi, which amounts to 603 of the 620 parts of a *nakṣatra*. And in the same time, viz. in the duration of a tithi, the sun advanced just forty-five such parts. I will just venture on mentioning that a reference to these forty-five parts is perhaps contained in v. 26. There some manuscripts read not “*navabhir*” but “*navatim*”, and Somākara explains “*navatibhir*”; if we adopt one of these latter readings, the verse directs us to divide the “*sūryarkṣa-bhāgān*” by ninety and then to multiply the result by two, which is the same thing as dividing them by forty-five. This is, however, only a conjecture, and I am unable to give a satisfactory translation of the verse.

Let us now turn to the verses referring to the *adhimāsas*. The *yuga* containing sixty-two lunar months to sixty solar months two of the lunar months had to be treated as excessive (*adhimāsa*). To this arrangement manifestly refers v. 37, although all its words are not quite clear. The editor of the *Jyotisha* hesitatingly renders the first word by “two less”, pointing out at the same time that Somākara seems to explain “*dvi*” by “*dinam*” (the words of the latter are: *द्वयं द्विषष्टिभागेन प्रत्येकं दिनं द्वाषष्टेन भागेन हल्लेति*); the latter explanation really appears to be the right one. That the word “*dvi*”, strange as it may appear, is used in the sense of “day” in several passages of the *Jyotisha* cannot be doubted (cf. p. 5 of Prof. Weber’s edition), and if we take it in that sense, the verse may be translated as follows: “a day diminished by its sixty-second part is to be deducted from the sun (the solar measure), etc.” A (*sāvana*) day of 603 *kalās* diminished by its sixty-second part ($9 \frac{4}{5}$) equals $593 \frac{1}{5}$ *kalās*, which is the length of a tithi, and thirty solar days being equal to thirty-one tithis, the verse apparently states in what manner the difference of solar and lunar time sums itself up. The word “*sapārvaṇam*” or “*saparvaṇaḥ*” must therefore express in some manner the period during which the mentioned difference amounts to one tithi; it may perhaps be translated “at each *parvaṇ*”, *parvaṇ* denoting either the new moon *parvaṇ* or the full moon *parvaṇ* only. (Prof. Weber is inclined to refer the “*dvi*” in *dvyūnam* to the two *lavas* which constitute the difference between Garga’s lunar day and *sāvana* day; but this is impossible for two reasons; firstly, the division of the day into *lavas* is not made use of in the *Jyotisha*, and secondly, the difference necessitating the establishment of two *adhimāsas* is not between lunar time and *sāvana* time, but between lunar time and solar time, 1860 tithis being equal to 1800 solar days). The second half of the verse presents no difficulties” produced by which there are formed in addition two excessive months in the middle and at the end (of the *yuga*).” The thing was therefore managed in this way that the thirty-first and the sixty-second lunation of the *yuga* were not counted but combined with the following ones into one month. It is well known that the advanced Indian astro-

mony of a later period effects the agreement between lunar and solar time in a similar way ; basing however on more exact datas regarding the revolutions of the sun and the moon it does of course, not pass over every thirty-first lunation.

To the question about the adhimāsa another verse of the Jyotisha also seems to refer, viz. verse 12, of which Somākara gives a very peculiar explanation, founded on his view of the meaning of the word páda.

The latter he supposes to signify the fourth part of the time which is required for the performance of the darsápúrṇamāsa sacrifices and which, according to him, is itself called "parvan" in different places of the Jyotisha ; the duration of this fourth part is thirty-one, viz. nádikās. The sense of the verse is therefore, according to him, as follows "if the parvan (the lunar half month) is diminished, (the diminution) is in (*i. e.* does not exceed) a páda, *i. e.* the time of thirty-one nádikās." By this diminution he seems to understand the difference of sávana and lunar time. But, as Prof. Weber has already pointed out, a statement of this nature would be perfectly useless, since the difference between the two measures during a lunar half month amounts to $\frac{1}{8}\frac{5}{8}$ of a sávana day only and therefore of course does not exceed 31 nádikās, being in fact less than half that amount. Prof. Weber would therefore prefer to take parvan as meaning the whole lunar month; but even on this supposition the statement of the verse would be of a strange indefiniteness ; why say that the difference between lunar and sávana time in the course of one lunar month amounts to less than $\frac{1}{8}\frac{5}{8}$ of a sávana day when it actually amounts to $\frac{1}{8}\frac{5}{8}$ and when it was very easy to calculate the latter exact amount from the fundamental data of the Jyotisha ? Besides, it appears to me that we have no right at all to supply the word nádikā in this verse as well as in many other verses where Somākara makes use of it. It seems to me that the simplest explanation of the verse would be the following "if a parvan is to be deducted (for the sake of establishing harmony between lunar and solar time) it is to be done at a quarter (*viz.* of all parvans) ; and such a quarter comprises thirty-one (*viz.* parvans, the whole yuga containing one hundred and twenty-four parvans)." So that the verse is only another statement of the fact that each sixty-second lunar month is to be left out *i. e.* not to be counted. I pass at once to v. 30, where the word páda again occurs (in the compound catuṣpádī). The verse states the number of the sub-divisions of the yuga according to the different measures of time. The first quarter of the verse is obscure in spite of Somākara offering an explanation. He combines the two first pádas and interprets them as follows :

यत्प्राज्ञं सौरमयममृदयनाद्युक्तं तद्वेषश्चन्द्रस्य यमे समस्त्यायनानि पञ्चविंशं मतमेकान्
चतुर्विंशं वा भवतीति वाक्यशेषः । चन्द्रमासापेक्षया प्रतिमासं द्वे द्वे द्युतेतन् यत्तच्चन्द्रमासाः
चतुर्विंशत्येव भवन्ति । .

That by "ayanány rishesh" we have to understand sidereal (nákshatra) half months (so called from analogy to the ayanas of the sun) cannot be doubted; but it is impossible to state their number as being either one hundred and thirty-five or one hundred and thirty-four, since the yuga always contains sixty-seven náksatra months only. The admission of an alternative between the two numbers would in fact be subversive of the whole system of the Jyotisha. I am not able myself to give a satisfactory explanation of the first páda, but at any rate the second páda must be separated from it and translated: the ayanas of the moon *i. e.* the sidereal half months are one less (*viz.* than one hundred and thirty-five) *i. e.* one hundred and thirty-four. When we come to read after this something about parvans, we naturally expect a statement of their number too, and I think that the third páda means nothing else than "the parvans are a tetrad of pádas", *i. e.* (a páda having been said above to be equal to thirty-one) are one hundred and twenty-four in number; which agrees of course with the *ḍátas* of the Jyotisha. Prof. Weber takes parvan in this passage as meaning the holy time at each parvan and páda as meaning the fourth part of that time, equal to thirty-one nádikás (in accordance with Somákara's explanation of v. 12) and translates: the parvans have four quarters, *i. e.* last 124 nádikás; but this interpretation is certainly less simple than the one given above and is not even countenanced by the commentator, whose remarks on the passage are: पादलिङ्गानु वैकिकेतुक्तम् । तेषां चतुष्पादी चत्वारः पादास्तुविंशं व्रतमित्यर्थः । केषां पञ्चाशत् । सर्वसाधना । यस्मादधिकमासाभ्यां सप्त तत्र तत्र द्वाषष्टिर्मासास्त्रादेतेषां तत्र समस्तम् ।

I have to add only two short remarks. In v. 5 (of those verses which are found in the Rik-recension only), we must read पौर्णमासी च चोदशीम् instead of ०र्षी चोदशीम्. The verse contains a statement of the dates of the equinoxes during the five years of the yuga, and a calculation of these dates according to the elements of the Jyotisha shows the necessity of the emendation. V. 16 contains the words पौलस्त्येऽङ्गते which Somákara explains by चन्द्रमस्यङ्गते. There is, however, no authority for taking the word "Paulastya" to be a name of the moon, while Pulastya is mentioned as father of Agastya in the Vishṇupurāṇa. The star Agastya (Canopus) is, as it is well known, frequently mentioned in the earliest Indian astronomical treatises, and, as it is visible in Northern India only during a part of the year, the verse of the Jyotisha seems to state that something—although it is obscure what—is taking place during that part of the year in which Agastya is not visible.

A great part of the Jyotisha remains unexplained; vv. 11, 13—17, 19—23, 25—27, 29, 41 especially are still quite obscure in spite of Somákara's attempts at elucidation. It may be expected that, should the corresponding parts of the Garga-samhitá be recovered, light would fall from

them on the obscurities which baffle us at present. I do not however think that anything new would be added to our knowledge of the elements of the Jyotisha. The latter seem to contain nothing but the doctrine about the yuga consisting of a certain number of months of the different kinds, the statement regarding the coincidence of the yuga's beginning with the winter solstice and the new moon of Māgha, the new moon taking place in the first point of śravishthā, and the rule stating the duration of the longest and shortest days together with the regular increase and decrease of the day during the whole year. All the remainder of the Jyotisha apparently contains nothing but deductions from these elements and is therefore of a secondary interest only.

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*Translations from the Hamāseh and the Aghānī.*—By  
C. J. LYALL, C. S.

I.

Qureyṣ son of Uneyf, of the Bel-'Ambar.

Certain men of the Benū Sheybān had fallen upon his herds and carried off thirty camels; whereon he asked help from his kin of the Bel-'Ambar, but they helped him not. Then he betook himself to the men of Māzin, and a company of them went forth with him and drove away a hundred camels of the herds of Sheybān and gave them to him, and guarded him until he came again to his tribe. And he said—

بَنُو اللَّقِيطَةِ مِنْ ذَهْلِ ابْنِ شَيْبَانَ  
عِنْدَ الْحَفِيطَةِ إِنْ ذُو لُؤْتَةٍ لَأَنَا  
طَارُوا إِلَيْهِ زَرَافَاتٍ وَوَحْدَانَا  
فِي النَّائِبَاتِ عَلَى مَا قَالَ بُرْهَانَا  
لَيْسُوا مِنَ الشَّرِّ فِي شَيْءٍ وَإِنْ هَانَا  
وَمِنْ إِسَاءَةِ أَهْلِ السُّوءِ أَحْسَانَا  
سِوَاهُمْ مِنْ جَمِيعِ النَّاسِ أَنْسَانَا  
شَدُّوا الْأَغَارَةَ فُرْسَانَا وَرُكْبَانَا

لَوْ كُنْتُ مِنْ مَازِنٍ لَمْ تَسْتَجِبْ إِلَيَّ  
إِذَا لَقَامَ بِنَصْرِي مَعْشَرُ خَشْنٍ  
قَوْمٍ إِذَا انْتَشَرْتُ أَبْدِي نَاجِيَتِهِ لَهُمْ  
لَا يَسْأَلُونَ أَخَاهُمْ حِينَ يَنْدَبُهُمْ  
لَكِنَّ قَوْمِي وَإِنْ كَانُوا ذَرَى عَدُوِّ  
يَجْزُونَ مِنْ ظَلَمِ أَهْلِ الظُّلَمِ مَغْفِرَةً  
كَأَنَّ رَيْبَكَ لَمْ يَخْلُقْ لِحَشِيَّتِهِ  
فَلَيْتَ لِي بِهِمْ قَوْمًا إِذَا رَكِبُوا

Had I been a man of Māzin, there had not plundered my herds  
 the sons of the Child of the Dust; Duhl son of Sheybān !  
 There had straightway arisen to help me a heavy-handed kin,  
 good smiters when help is needed, though the feeble bend to the  
 blow :

Men who, when Evil bares before them his hindmost teeth,  
 fly gaily to meet him, in companies or alone.

They ask not their brother, when he lays before them his wrong  
 in his trouble, to give them proof of the truth of what he says.

5 But as for my people, though their number be not small,  
 they are good for nought against evil, however light it be.

They requite with forgiveness the wrong of those that do them wrong,  
 and the evil deeds of the evil they meet with kindness and love ;

As though thy Lord had created among the tribes of men  
 themselves alone to fear Him, and never one man more.

Would that I had in their stead a folk who, when they ride forth,  
 strike swiftly and hard, on horse or on camel borne !

## NOTES.

The measure is the second form of the *besif*, and is thus scanned :—

— — — — — | — — — — — | — — — — — | — — — — — || — — — — — | — — — — — | — — — — — | — — — — —

This poem is the first of the Ḥamāseh, and fitly holds that place: no better epitome of the national character of the ancient Arab could be found than its third verso.

v. 1. The Benû Māzin and the Benu-l-'Ambar (or Bel-'Ambar) were both sub-tribes of Temim. Duhl son of Sheybān was the family name of a great sub-division of the tribe of Bekr son of Wā'il.

"The Child of the Dust," *el-laqīṭah*, that is, a foundling: the mother of the tribe of Duhl appears to be meant, but the commentators give no very certain information on the point. Another reading is *esh-Shuqīqah*, the name of the mother of a family in Duhl.

v. 8. "Strike swiftly and hard," *sheddu-l-'ighārata*: another reading is *shennu-l-'ighārata*, "pour down on their enemies from every side." This verso is the *locus classicus* for the use of the preposition *bi* in the sense of "instead of": a sense arising out of its use with verbs of paying, buying, &c., for the price; and that again arises out of one of its original senses, that of the instrument.

## II, III, IV, and V, four songs of the Benu-l-Hārith ibn Ka'b.

The Benu-l-Hārith ibn Ka'b dwelt in Nejrān, a fertile valley of el-Yemen; they were the chiefest of the tribes of Maḏhij (although probably themselves of Ma'addic origin\*), and in the time of the Prophet were the acknowledged leaders of that stock.

\* This would appear from a poem in the Ḥamāseh (pp. 160-1, Freytag's Edn.), where a man of 'Abs claims the Benu-l-Hārith as his brothers; but the author of the Aghānī, in the genealogies he gives of Hārithis, knows only their traditional descent from Kahlān.

About half the tribe were Christians, and maintained their faith stoutly against the proselytizing Jew King of el-Yemen, Ḍū-Nuwās, who in 523 A. D. led an army against the city of Nejrán and besieged it. The story of the Martyrdom of the Christians of the Benu-l-Ḥārith will be found told by a contemporary writer, Simeon the Syrian bishop of Beth-Arsham, in Vol. I of Assemani's *Bibliotheca Orientalis*, pp. 359 *seqq.*\* their prince is therein called Ḥāreth bar Kāleb, who with his wife Rūma suffered death for the faith, and has become known in the Church as S. Arethas the son of Caleb; it seems probable that "Ḥāreth son of Kāleb" is really the tribal name, el-Ḥārith ibn Ka'b: in Syriac the *syn* of Ka'b and the *lām* of Kāleb differ only in size. The sequel of this deed of Ḍū-Nuwās is well known; the rule of the Ḥimyerites in el-Yemen was overthrown by the Abyssinians under Aryāt, sent by the king of Æthiopia at the instigation of the Emperor of Constantinople to avenge the slaughter of the Christians of Nejrán. The Christian Church at Nejrán was still flourishing in the time of the Prophet, who in the ninth year of the Hijrah was visited at el-Medīnah by a deputation of forty ecclesiastics (*aḥbār*), headed by a bishop, and twenty laymen from that place. The conversation which ensued is told in the *Aghānī*, X, 144; in the end the Christians of Nejrán obtained from Moḥammed a treaty securing to them, on the payment of tribute, the free exercise of their religion, and the portion of the tribe which had remained pagan in the same year gave in its adhesion to el-Islām. The treaty with the Christians was renewed by Abū-Bokr after the death of Moḥammed, but 'Omar, in pursuance of the Prophet's dying injunction that none but Muslims should be left to dwell in Arabia, removed them to Syria, where they received lands in exchange for those they surrendered in Nejrán. (A. H. 13.)

The most noble family of the Christian Ḥārithis was the house of ed-Dayyān, to which belonged the author of the fourth of the pieces given below. The son of ed-Dayyān was 'Abd-el-Madān, who had three sons, Yezīd, 'Abd-el-Mesīḥ, and Qeys. Yezīd was one of the most noble and generous Arabs of his day; and 'Abd-el-Mesīḥ and Qeys were two of the leaders of the deputation which visited Moḥammed in A. H. 9. The three brothers built a church (*bi'ah*) or, as some say, set up a great tent made of three hundred skins of red leather (one of the chief products of el-Yemen), at Nejrán, which was called "the Ka'beh of Nejrán"; it was a sanctuary where all who were in need found help and refuge. All three were friends and patrons of Moymūn el-A'shā, who praises them in his poems, and learned from them the many Christian precepts which occur in his verse.

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\* The latest contribution to the history of the persecuted Monophysite Christians of Nejrán will be found in the *Zeitsch. d. Deutsch. Morg. Gesellsch.*, Vol. XXXI, p. 360. A Syriac letter of comfort addressed to them by Jacob of Sarḡ, exhorting them to patience and faith under their trials, is there given with a translation and commentary by Dr. R. Schröter, who has added a Syriac version of a Greek hymn by Johannes Psaltes, Abbot of Beth Aphthonius, on the subject of the martyrdom of those slain by Ḍū-Nuwās. The latter must have been composed within a year or two of the event; for it was translated from Greek into Syriac by Bishop Paul of Edessa, who died in 527 A. D. From it we learn (1) the name of the Jew-king, who is called *Masrāq*, the same in Syriac as Ḍū-Nuwās in Arabic ("Long-locks"); (2) the number of the slain, something over two hundred; and (3) the name of their teacher, Ḥāreth.

Dr. Schröter has not referred to the Æthiopic poems in which the constancy of the martyrs of Nejrán is praised.

'Abd-Yaghūth, as his name shows, was of the pagan Hārithis: the idol Yaghūth ("the Helper") is mentioned with Ya'laq and Neis in v. 23 of the 71st Sūrah of the Qur'ān: all three were worshipped by the Arabs of el-Yemen. The author of the second and third pieces, Ja'far son of 'Olbeh, was the great-grandson (Aghānī XI, 146) or great-great-grandson (Agh. XV, 73) of 'Abd-Yaghūth. Much uncertainty prevails regarding the date of his death. The Aghānī calls him "a *mukhaḍḍim* of the two Rules," that is, a poet who flourished under both the houses of Umayyeh and el-'Abbās; according to this work (where several differing versions of his story are given) he was slain at Mokkeh in the reign of el-Mansūr Abū Ja'far (A. H. 136—158). But in the commentary on the Hamāseh by et-Tebrizī he is said to have been put to death in the Khalīfate of Hishām son of 'Abd-el-Malik the Umawī (A. H. 105—125). The "Day of Saḥbal" was the adventure which led to his death: to avvenge an insult put upon him by the Benū 'Oqeyl, he made a raid upon them, and was returning with his booty when he was beset by the 'Oqeylis in the valley of Saḥbal. He fought his way through them and escaped; but having slain one of the 'Oqeylis, that tribe accused him of murder before the Khalīfah's Governor at Mokkeh, who, after vain attempts to save his life, was obliged to deliver him up to his accusers, who put him to death.

The date of the Day of el-Kulāb is fixed by Caussin de Perceval as A. D. 612.

## II.

The death-song of 'Abd-Yaghūth, chief of the Benu-l-Hārith ibn Ka'b of Nejrān. (Aghānī XV, 75-76).

After the slaughter of their fighting-men by the Governor of Kisrā at el-Mūshaqqar, the Benū Temīm withdrew from el-Bahrān to the valley of el-Kulāb, near the great waste called ed-Dahnā, south of el-Yemāmeh. Their helpless state there moved the covetousness of the people of el-Yemen, and all the tribes of Maḍḥij gathered together to plunder them. But warning was brought to the people of Temīm, and they arrayed themselves for battle; and the fight lasted the whole day long, until night parted them. And they watched one another through the night, and at dawn went forth again to battle. Then the fury of the men of Temīm prevailed, and those of Maḍḥij were driven in headlong rout; and many a chief was slain, and many a footman taken captive. 'Abd-Yaghūth was the leader of Maḍḥij on that day: he too was taken captive, and 'Ismeh son of Ubeyr of Teym carried him to his house, where they made ready to slay him in requital for the death of en-No'mān son of Jessās, the leader of Temīm, who had fallen in the first day's fight. And they feared lest he should utter satires against them, and make them a *ḥu*-word among the Arabs; therefore they were about to gag him, when he promised that he would utter no word of reviling against them: so they left his tongue free. Then said he—"O ye sons of Teym, let me die as befits one noble." "And how wouldst thou die?" asked 'Ismeh. "Give me wine to drink, and let me sing my death-song." "So be it," said 'Ismeh; and he plied him with wine, and cut one of his veins, and left him until the blood all flowed forth from his body. And as his life ebbed, 'Ismeh's two sons who stood by began to upbraid him: "Thou didst gather together against us all el-Yemen," said they: "but now behold how God has dealt with thee." Then said 'Abd-Yaghūth—

أَلَا تَلَوْمَانِي كَفَى اللّٰهُ مَا بَيَّأَ      فَمَا لَكُمْ فِي اللّٰهِ نَفْعٌ وَلَا لِيَا  
أَلَمْ تَعْلَمَا أَنَّ الْكَلِمَةَ نَفَعَهَا      قَلِيلٌ وَمَا كَوْمِي أَخِي مِنْ شِمَالِيَا

فَيَا رَاكِبًا إِنَّمَا عَرَضَتْ قَبْلَهَا  
أَبَا كَرِبٍ وَالْأَيْهَمِينَ كَلَيْهِمَا  
جَزَى اللَّهُ قَوْمِي بِالْكَلاِبِ مَلَامَةً  
وَلَوْ شِئْتُ لَجَنَنْتِي مِنَ الْخَيْلِ نَهْدَةً  
وَلَكِنِّي أَحْمِي ذِمَارَ أَبِيكَمُ  
وَتَضَحُّكَ مِنِّي شَيْخَةً عَبْشَمِيَّةً  
وَقَدْ عَلِمْتُ عَرْسِي مُلْكَةً أَنَّنِي  
أَقُولُ وَقَدْ شَدُّوا لِسَانِي بِنَسْعَةٍ  
أَمْعَشَرَ تَيْمٍ قَدْ مَلَكْتُمْ فَاسْجُرُوا  
فَإِنْ تَقْتُلُونِي تَقْتُلُونِي سَيِّدًا  
أَحَقًّا عِبَادَ اللَّهِ أَنْ لَسْتُ سَامِعًا  
وَقَدْ كُنْتُ نَحَارَ الْجُزُورِ وَمُحَمَّدَ الْمَطِيِّ وَأَمْضِي  
وَأَنْحَرُ لِلشَّرْبِ الْكَرَامَ مَطِيئِي  
وَعَادِيَّةَ سَوْمِ الْجَرَادِ وَزَعْنُهَا  
كَأَنِّي لَمْ أَرْكَبْ جَوَادًا وَلَمْ أَقُلْ  
وَلَمْ أَسْبَأِ الزِّقَ الرَّوِّيَّ وَلَمْ أَقُلْ  
نَدَامَايَ مِنْ نَجْرَانَ إِلَّا تَلَايَا  
وَقَيْسًا بِأَعْلَى حَضْرَمَوْتَ الْيَمَانِيَا  
صَرِيحُهُمُ وَالْآخَرِينَ الْمَوَالِيَا  
تَرَى خَلْفَهَا الْخَوَّ الْجِيَادَ تَوَالِيَا  
وَكَانَ الرِّمَاحُ يَخْطُفُنَ الْمُحَامِيَا  
كَأَنَّ لَمْ تَرَ قَبْلِي أَسِيرًا يَمَانِيَا  
أَنَا اللَّيْثُ مَعْدُورًا عَلَيْهِ وَعَادِيَا  
أَمْعَشَرَ تَيْمٍ أَطْلُقُوا لِي لِسَانِيَا  
فَإِنْ أَخَاكُم لَمْ يَكُنْ مِنْ بَوَائِيَا  
وَأَنْ تُطْلِقُونِي تَحْرُبُونِي بِهَمَالِيَا  
نَشِيدَ الرُّعَاءِ الْمُعْرَبِينَ الْمُتَالِيَا  
مَاضِيَا  
وَأَصْدَعُ بَيْنَ الْقَيْنَتَيْنِ رَدَائِيَا  
بِكَفِّي وَقَدْ أَنْحَوَا إِلَى الْعَوَالِيَا  
لِخَيْلِي كَرَى نَفْسِي عَنْ رَجَالِيَا  
لَا يَسَارُ صِدْقٍ أَعْظَمُوا ضَوْءَ نَارِيَا

Upbraid me not, ye twain ! shame is it enough for me  
to be as I am : no gain in upbraiding to you or me.

Know ye not that in reproach there is little that profits men ?

It was not my wont to blame my brother when I was free.  
O rider, if thou lightest on those men who drank with me  
in Nejrân aforetime, say—' Ye shall never see him more !'

—Abû Kerib and those twin el-Eyhem, the twain of them,  
and Qeys of el-Yemen who dwells in the uplands of Ḥaḍramaut.

- 5 May God requite with shame my people for el-Kulâb—  
 those of them of pure race, and the others born of slaves !  
 Had it been my will, there had borne me far away from their horse  
 a swift mare, behind whom the black steeds lag in a slackening  
 throng :  
 But it was my will to shield the men of your father's house,  
 and the spears all missed the man who stood as his fellows' shield.  
 The matron of 'Abd-Shems laughed as she saw me led in bonds,  
 as though she had seen before no captive of el-Yemen :  
 But one knows—Muleykeh my wife—that time was when I stood forth  
 a lion in fight, whether men bore against me or I led on.
- 10 I said to them when they bound my tongue with a leathern thong  
 —' O kinsmen of Teym, I pray you, leave me my tongue yet free !  
 ' O kinsmen of Teym, ye hold me fast : treat me gently then ;  
 ' the brother ye lost was not the equal in place of me.  
 ' And if ye must slay me, let me die at least as a lord ;  
 ' and if ye will let me go, take in ransom all my wealth.' '  
 Is it truth, ye servants of God—I shall hear no more the voice  
 of herdsmen who shout for their camels in the distant grazing-  
 grounds ?  
 Yea, many a beast did I slay, and many a camel urge  
 to her swiftest, and journey steadfast where no man dared to go ;
- 15 And ofttimes I slew for my fellows my camel at the feast,  
 and ofttimes I rent my robe in twain for two singing-girls,  
 And ofttimes withstood a host like locusts that swept on me  
 with my hand alone, when all the lances on me were turned.  
 Now am I as though I never had mounted a noble steed,  
 or called to my horsemen—' Charge ! give our footmen breathing-  
 space !'  
 Or bought the full skin of wine for much gold, or shouted loud  
 to my comrades stout—' Heap high the blaze of our beacon-fire !'

## NOTES.

The metro is the *Tawîl*, second form.

v. 4. Of the persons mentioned in this verse Ibn-el-Athîr (Kâmil, Vol. I, p. 469) says that Abû-Kerib was Bishr son of 'Alqameh son of el-Hârith, while the two el-Eyhem (*Eyhem* means foolish, stupid, and was given as a nickname to many people : two kings of Ghassân bore it) were el-Aswad son of 'Alqameh son of el-Hârith, and el-'Âqib (*the chief, lord*), whose full name was 'Abd-el-Mesîh son of el-Abyad ; Qeys was Qeys son of Ma'di-Kerib. Of these the last was chief of the tribe of Kindoh, and was surnamed *el-Ashajj*, "the Scarred"; he was praised by el-A'shâ. El-'Âqib and el-Aswad el-Eyhem were two leaders of the deputation from Nejrân to Mohammed at el-Medîneh in A. H. 9. Of the first I have been able to discover nothing further.

v. 6. This verse is variously given. Ibn-el-Athîr (*l. c.*) reads—

وَلَوْ شِئْتُ نَجِّنِي مِنَ الْقَوْمِ شَطْبَةً      تَرَى خَلْفَهَا الْكُمْتُ الْعِناقَ تَوَالِيَا

et-Tebrizi, in his commentary on the *Hamāseh* (p. 299), quotes it thus :

وَلَوْ شِئْتُ نَجِّنِي مِنَ الْخَيْلِ شَطْبَةً      تَرَى خَلْفَهَا الْجُرَدَ الْعِناقَ مَتَالِيَا

Caussin de Perceval (*Essai*, ii. 589), apparently following the *Kitāb-al-Iqd*, reads—

وَلَوْ شِئْتُ نَجِّنِي مِنَ الْخَيْلِ مُهْرَةً      تَرَى خَلْفَهَا الْجُرَدَ الْخِصَانِ مَوَالِيَا

The first and second readings in the first hemistich give *shat'beh*, a mare light of flesh and active, instead of our *nahdeh* : the third gives *muhrah*, a young mare ; in the second hemistich, instead of our *el-huwu-el-jiyād*, "the noble black horses," Ibn-el-Athir reads "the noble ('itāq) bays," et-Tebrizi, "the noble short-haired steeds" (*jurd*), and C. de Perceval "the beautiful short-haired steeds." As the last word of the verse *tawdliya* (plural of *tāliyah*, "following") is decidedly best; *ma'wāliya*, C. de P.'s reading, seems to be a word-play on the reading 'itāq, since it means *slaves* in opposition to *free-born* ('itāq) : such a play is foreign to old Arab verse. *El-idl* is a special word used for the fourth horse in a race where ten run, and thus appropriately describes the place of the pursuers.

v. 7. *Dimār* has the same meaning as *haqiqah*, viz, the persons whom it is one's duty to defend. I am somewhat doubtful of the rendering of the second hemistich of this verse. I have taken *yekhlafina* as meaning "missed," which is apparently a possible sense ; but it may also mean "carried away, suddenly took possession of," and may refer to his having been taken prisoner while he covered the retreat of his tribe.

v. 8. "Of 'Abd-Shems," that is, descended from 'Abd-Shems, son of Sa'd, son of Zeyd-Menāt, son of Tomīm.

v. 10. "Teym." This family did not belong to Tomīm, but was one of the *Ribāb*, or five confederate tribes, whose fortunes were at this time linked to those of Tomīm : the five were Dubbeh, Teym, 'Adī ibn 'Abd-Menāt, 'Okl, and Thaur ; they were all descended from Udd, son of Tābikhah son of Ilyās. Teym is probably shortened for Teym-el-Lāt, ("servant of el-Lāt") a name borne by many of the Arab families, which Mohammed changed into Teym-allāh ("servant of God").

v. 12. The last words of the second hemistich (*tahrubāni bimāliya*) may be more literally rendered "despoil me of all my wealth."

v. 13. "Ye servants of God," *'ibāda-llāhi* : there is reason to suspect that this has been altered from *'ibāda-llāti*, "servants of el-Lāt," which would be a paraphrase of the name of the tribe he was addressing, Teym-el-Lāt. *El-metālī*, plural of *el-mutlī*, means "she camels having their young ones following them"; *mo'zibān* is "driving camels to distant pastures."

v. 17. *Rijāl* is here a plural of *rājūl*, a foot soldier, not of *rajul*, a man.

v. 18. "Comrades stout," *aysāru yāqin* : *aysār* are companions gathered together for the arrow-gambling called *el-Meyār* ; this was played in the winter time, and by men sitting over the fire at night ; the call to heighten the blaze was in order that the fire might be more conspicuous to the night-wanderer seeking for a shelter.

## III.

Ja'far son of 'Olbeh, of the fight at Qurra Sahbal.

|                                                   |                                                |
|---------------------------------------------------|------------------------------------------------|
| أَلْهَفَى بِقُرَى سَحْبَلٍ حِينَ أَحَلَبَتْ       | عَلَيْنَا الرُّوَابَا وَ الْعَدُو الْمُبَاسِلُ |
| فَقَالُوا لَنَا نَتْنَانِ لَا بَدَّ مِنْهُمَا     | صُدُّورُ رِمَاحٍ أُشْرِعَتْ أَوْ سَلَسَلُ      |
| فَقُلْنَا لَهُمْ تَلُكُمُ إِذَا بَعْدَ كَرَّةٍ    | تَغَادُرُ صَرَغَى نَوْمَهَا مُتَخَاذِلُ        |
| وَلَمْ نَدْرِ إِنْ جِضْنَا مِنَ الْمَوْتِ جِضَةً  | كَمْ الْعَمْرُ بَاقٍ وَالْمَدَى مُتَطَاوِلُ    |
| إِذَا مَا ابْتَدَرْنَا مَارِقًا فَرَجَتْ لَنَا    | بِأَيْمَانِنَا بِيضٌ جَلَّتْهَا الصِّدَاقِلُ   |
| لَهُمْ صُدُّورُ سَيْفِي يَوْمَ بَطْحَاءِ سَحْبَلٍ | وَلِي مِنْهُ مَا ضَمَّتْ عَلَيْهِ الْإِنَامِلُ |

Alas for Qurra Sahbal! the day that upon us drave  
the crowd of frightened women, and the foemen pressed us sore.  
They said to us—'Two things lie before you: now must ye choose—  
'the points of the spears couched at you, or, if ye will not, chains.'  
We answered them—'Yea, this thing may fall to you after fight,  
'when men shall be left on ground and none shall arise again;  
'But we know not, if we quail before Death's oncoming,  
'how much may be left of life; the goal is too far to see.'

- 5 When we strode to the strait of battle, there cleared us a space around  
the white swords in our right hands which the smiths had fur-  
bished fair;  
To them fell the edge of my blade on that day of Sahbal dale,  
and mine was the share thereof wherever my fingers closed.

## NOTES.

The measure is the second form of the *Tawil*.

This poem, if we may trust the account of the adventure to which it relates given in the Aghânî, has been manipulated by Abû Temmâm; as given in the Hamâsch, it suggests an attack by the enemy on the tribe of the poet, a sudden surprise, with terrified women and few men to withstand a threatening foe; but as the tale is told by el-Isfahânî (Agh. XI, 147), Ja'far with two companions went forth to plunder the herds of 'Oqeyl, and was beset on his way back by detached parties of that tribe in the valley of Sahbal, whom he overcame and reached home safe. Another version of the poem is given in the Aghânî which contains many more lines than that in the Hamâsch, and some notable differences in those which are common to both; it is not necessary to give here the lines by which the Aghânî exceeds the Hamâsch: but the differences may be briefly stated. v. 1 is in the Aghânî—

عَشِيَّةَ قُرْنِي سَجْبَلٍ إِذْ تَعَطَّطَتْ عَلَيْنَا السَّرِيَا وَالْعُدُو الْمُبَاسِلُ

This reading (which follows an introductory verse) avoids the difficulty caused by the word *alahfā* ("alas") in the Hamāseh's version; the poem is one of exultation: why should it open with "Alas!"? It also, instead of *el-weldāyā*, "the weak and frightened women," gives *es-sarīyā*, "the troops of horse," and instead of the difficult name Qurā, reads *garney*, "the two horns" (that is, probably, the two mountain peaks between which the valley of Sahbal lay). The verse may be rendered—

"That even when under Sahbal's twin peaks upon us drove  
the horsemen troop after troop, and the foemen pressed us sore."

v. 2 is exactly the same in the Aghānī. So is v. 3, except that in the second hemistich for *na'u'uhā* the Aghānī reads *nahdūhā*, a word of the same meaning. v. 4 does not occur at all in the Aghānī's version. v. 5 is the same in both as to the second hemistich, but the first in the Aghānī is—

إِذَا مَا رُصِدْنَا مَرَصِدًا فَرَجَتْ لَنَا

"Their ambush beset our road, but there cleared us a space around  
the white swords in our right hands which the smiths had furbished fair."

v. 6 is the same in the Aghānī and the Hamāseh.

#### IV.

The same, in ward at Mekkeh.

|                                                   |                                                |
|---------------------------------------------------|------------------------------------------------|
| جَنِيْبٌ وَجُثْمَانِي بِمَكَّةَ مَوْثِقُ          | هَوَايَ مَعَ الرِّكْبِ الْيَمَانِيْنَ مُصْعِدُ |
| إِلَى وَبَابِ السِّجْنِ دُونِي مُغْلَقُ           | عَجِبْتُ لِمَسْرَاهَا وَأَنِّي تَخَلَّصْتُ     |
| فَلَمَّا تَوَلَّيْتُ كَادَتْ النَّفْسُ تَرْهَقُ   | أَلَمْتُ فَحَيَّتْ ثُمَّ قَامَتْ فَوَدَّعْتُ   |
| لِشَيْءٍ وَلَا أَنِّي مِنَ الْمَوْتِ أَفْرَقُ     | فَلَا تَحْسَبِي أَنِّي تَخَشَعْتُ بَعْدُكُمْ   |
| وَلَا أَنِّي بِأَلْمَشِيِّ فِي الْقَيْدِ أَخْرَقُ | وَلَا أَنَّ نَفْسِي يَزِدُّهَا وَعِيدُكُمْ     |
| كَمَا كُنْتُ أَلْقَى مِنْكَ إِذَا أَنَا مُطْلَقُ  | وَلَكِنْ عَرَنْتَنِي مِنْ هَوَاكِ صَبَابَةٌ    |

My longing climbs up the steep with the riders of el-Yemen  
by their side, while my body lies in Mekkeh a prisoner.

I marvelled as she came darkling to me and entered free,  
while the prison's door before me was bolted and surely barred.

She drew near and greeted me: then she rose and bid farewell;  
and when she turned, my life wellnigh went forth with her.

Nay, think not that I am bowed by fear away from you,  
or that I tremble before the death that stands so nigh,

- 5 Or that my soul quakes at all before your threatenings,  
 or that my spirit is broken by walking in these chains;  
 But a longing has smitten my heart born of my love of thee,  
 as it was in the days aforetime when that I was free.

## NOTES.

The measure is the same as in Nos. II and III.

This piece is given with almost the same text in the *Aghāni*, XI, 149; the latter, however, begins it with the second verse of the *Hamāseh*'s version, putting the verse which in it answers to the first last; this is

وَأَمَّا الْهَوَىٰ وَالْوَدُّ مَنِّي فَطَامِحُ الْيَكِّ وَجُثْمَانِي بِمَكَّةَ مُرَوِّقُ

My longing and my love stand gazing with straining eyes  
 for thee, while my body lies in Mekkeh a prisoner.

The *Aghāni* also inserts a verse between vv. 4 and 5 of the *Hamāseh*'s version; this is, however, clearly intrusive, and breaks the sequence of the thought: it is therefore not quoted here.

## V.

'Abd-el-Melik son of 'Abd-or-Rahīm, of the Benu-d-Dayyān.

إِذَا الْمَرْءُ لَمْ يَدْنَسْ مِنَ اللُّومِ عَرَضُهُ  
 فَكُلُّ رِدَاءٍ يَرْتَدِيهِ جَمِيلُ  
 وَإِنْ هُوَ لَمْ يَحْمِلْ عَلَى النَّفْسِ ضَمِيمَهَا  
 فَلَيْسَ إِلَى حَسَنِ التَّنَادِ سَبِيلُ  
 تَعَيَّرْنَا أَنَا قَلِيلٌ عَدِيدُنَا  
 فَقُلْتُ لَهَا إِنَّ الْكَرَامَ قَلِيلُ  
 وَمَا قَوْلٌ مِّنْ كَانَتْ بَقَايَاهُ مِثْلَهَا  
 شَبَابٌ تَسَامَى لِلْعُلَى وَكُهُولُ  
 وَ مَا ضَرَرْنَا أَنَا قَلِيلٌ وَ جَارُنَا  
 هَزِيْزٌ وَ جَارِ الْأَنْثَرَيْنِ ذَلِيلُ  
 لَنَا جَبَلٌ يَحْتَلِيهِ مَن نَجِيرُهُ  
 مُذَيِّفٌ يَرُدُّ الظَّرْفَ وَ هُوَ كَلِيلُ  
 رَسَا أَصْلُهُ الْكُرَى وَ سَمَا بِهِ  
 إِلَى النِّجْمِ فَرَعَ لَا يُنَالُ طَوِيلُ  
 وَ أَنَا لَقَرَمٌ مَا نَرَى الْقَتْلَ سَبَّةً  
 إِذَا مَا رَأَتْهُ عَامِرٌ وَ وَلُ  
 يَقْرَبُ حُبُّ الْمَوْتِ أَجَالَنَا لَنَا  
 وَ تَكْرَهُهُ أَجَالُهُمْ وَ نَطُولُ  
 وَمَا مَاتَ مِنَّا سَيِّدٌ حَتْفَ أَنْفِهِ  
 وَلَا طَلٌّ مِنَّا كُلُّ قَنِيلِ  
 تَسِيلُ عَلَى حَدِّ الطَّبَاتِ نَفْسُكُ  
 وَ لَيْسَتْ عَلَى غَيْرِ الطَّبَاتِ تَسِيلُ

صَفَوْنَا وَلَمْ نَكْدُرْ وَأَخْلَصَ سِرَّنَا  
 عَلَوْنَا إِلَى خَيْرِ الظُّهُورِ وَحَطَفْنَا  
 فَتَحْنُ كَمَا أَلْمَزْنَ مَا فِي نَصَابِنَا  
 وَفَنَكُرُ أَنْ شَدَّنَا عَلَى النَّاسِ قَوْلَهُمْ  
 إِذَا سَيِّدٌ مَثَا خَلَا قَامَ سَيِّدٌ  
 وَمَا أُخْمِدَتْ نَارُ لَنَا دُونَ طَارِقِ  
 وَأَيَّامُنَا مَشْهُورَةٌ فِي عَدُونَا  
 وَأَسْيَانُنَا فِي كُلِّ غَرْبٍ وَمَشْرِقِ  
 رَدَّةٌ إِلَّا تُسَلَّ نَصَالُهَا  
 سَلَى إِنْ جِهَلَتْ النَّاسُ عَنَّا وَعَنَهُمْ  
 فَإِنَّ بَنِي الدِّيَّانِ قُطِبَ لِقَوْمِهِمْ

إِنَّكَ أَطَابْتَ حَمَلَنَا وَفُحُولُ  
 لَوَقَّتَ إِلَى خَيْرِ الْبُطُونِ نَزُولُ  
 كِهَامٌ وَلَا فِينَا يُعَدُّ بَخِيلُ  
 وَلَا يُذَكِّرُونَ الْقَوْلَ هَيْنَ نَقُولُ  
 قَوْلُ لِمَا قَالَ الْكَرَامُ فَعُولُ  
 وَلَا ذَمَّنَا فِي النَّازِلِينَ تَنْزِيلُ  
 لَهَا غُرُرٌ مَعْلُومَةٌ وَحُجُولُ  
 بِهَا مِنْ قِرَاعِ الدَّارِعِينَ فُلُولُ  
 فَتَغْمَدَ حَتَّى يَسْتَبَاحَ قَبِيلُ  
 وَكَيْسَ سَوَاءٍ عَالِمٌ وَجَهُولُ  
 تَدُورُ رَحَاهُمْ حَوْلَهُمْ وَتَجُولُ

When a man stains not his honour by doing a deed of shame,  
 whatso be the raiment he wears, fair is it and comely;  
 And if he takes not on his soul the burden of loss and toil,  
 there lies not before him any road to praise and glory.

She cast blame on us that our number was little to count and few:

I answered her—'Yea: the count of noble men is little.

'But not few canst thou call those whose remnants are like to us  
 '—young men who vie with the old in the quest of glory.

'It hurts us nought that we be few, when our friend by us  
 'is safe, though the friends of most men beside be trampled;

'A mountain we have where dwells he whom we shelter there,  
 'lofty, before whose height the eye falls back blunted:

'Deep-based is its root below ground, and overhead there soars  
 'its peak to the stars of heaven whereto no man reaches.

'A folk are we who deem it no shame to be slain in fight,  
 'though that be the deeming thereof of Salâl and 'Amîr;

'Our love of death brings near to us our days of doom,  
 'but their dooms shrink from death and stand far distant.

- 10 'There dies among us no lord a quiet death in his bed,  
 'and never is blood of us poured forth without vengeance.  
 'Our souls stream forth in a flood from the edge of the whetted swords :  
 'no otherwise than so does our spirit leave its mansion.  
 'Pure is our stock, unsullied : fair is it kept and bright  
 'by mothers whose bed bears well, and fathers mighty.  
 'To the best of the uplands we wend, and when the season comes,  
 'we travel adown to the best of fruitful valleys.  
 'Like rain of the heaven are we : there is not in all our line  
 'one blunt of heart, nor among us is counted a niggard.
- 15 'We say nay whenso we will to the words of other men,  
 'but no man to us says nay when we give sentence.  
 'When passes a lord of our line, in his stead there rises straight  
 'a lord to say the say and do the deeds of the noble.  
 'Our beacon is never quenched to the wanderer of the night,  
 'nor has ever a guest blamed us where men meet together.  
 'Our Days are famous among our foemen, of fair report,  
 'branded and blazed with glory like noble horses.  
 'Our swords have swept throughout all lands both West and East  
 'and gathered many a notch from the steel of hauberk-wearers ;
- 20 'Not used are they when drawn to be laid back in their sheaths  
 'before that the folk they meet are spoiled and scattered.  
 'If thou knowest not, ask men what they think of ~~us~~ and them  
 '—not alike are he that knows and he that knows not.  
 'The children of ed-Dayyān are the shaft of their people's mill  
 '—around them it turns and whirls, while they stand midmost.'

## NOTES.

The metro is the third form of the *Tawīl*: the first hemistich is the same as in Nos. II, III and IV ; but the second is catalectic and is scanned thus :—

U — — | U — — | U — U | U — —

This poem stands in the *Hamāseh* under the name of es-Semau'al son of 'Ādiyā the Jew, but it is not by him ; this is proved by the mention of 'Āmir and Sulūl in verso 8, and of the Benu-d-Dayyān in v. 22. The mistake by which it has been attributed to es-Semau'al arose, as pointed out by et-Tebrizī against the passage, from v. 6, where the mountain spoken of, which is really a metaphor for the glory and renown of the tribe, has been thought to be the burg el-Ablaq in Teymā, where es-Semau'al dwelt, and where he sheltered the kin of Imra'el-Qoys the poet against el-Hārith son of Abū Shemir king of Ghassān.

Of the real author nothing is known except that he belonged to the noble stock of ed-Dayyān : his name recurs in the *Hamāseh* at p. 400 as the author of a *marthiyeh*,

and he is there called a native of Syria (*Sha'âmî*) and a metaphysician (*Kelâmî*); I have found no mention of him in the Aghânî, Ibn Khallikân, Ibn Quteybeh, or Hâjî Khalîfeh. It seems to me most probable that the piece belongs to the early wars of the Arabs during the spread of el-Islâm over Asia Minor, Armenia and Persia, and I should doubt its being the composition of a mere scholar. The fact that it was attributed to es-Semau'al shows that its authorship is uncertain, and that it cannot be set down to any other with confidence.

v. 5. "Our friend," *jâr*: this word is used for either (but most frequently for the weaker) of the two parties to a covenant of mutual protection (*jiwâr*); it is etymologically identical with the Hebrew *gêr*-(A. V. "stranger"), and the latter word frequently bears the same meaning: e. g. in Job xxxi. 32, where the LXX rightly render it by *ξένος*, which has the same double sense of host and guest, protector and protected.

v. 6. The mountain here referred to is the glory and great name of the tribe; the same metaphor occurs in a noble passage of the mo'allaqah of el-Hârith son of Hilzich (vv. 23—26.)

فَبَقِينَا عَلَى الشَّيْءِ تَنْمِيْنَا حُصُونٌ وَ عِزَّةٌ قَعَسَاءُ  
قَبْلَ مَا الْيَوْمُ بَيَّضَتْ بُعْيُونِ لِنَّاسٍ فِيهَا تَغِيْظٌ وَ اِبَاءُ  
فَكَانَ اَلْمُنُوْنَ تَرْدِيْ بِنَا اَرْ عَنْ جَوْنًا يَنْجَابُ عَنْهُ اَلْعَمَاءُ  
مُقَهَّرًا عَلَى اَلْحَوَادِثِ لَا تَرُ تَوْهُ لِّلْدَعْرِ مُزِيْدٌ صَنَاءُ

And we have stood, spite of their hate, and high towers  
and firm-based glory lift us aloft;  
Before to-day has it blinded the eyes  
of men in which were wrath and denial.  
As though the Fates beating against us met  
a black mountain cleaving the topmost clouds,  
Mighty and strong above the changes of things,  
which no shock of the Days can soften or shake.

v. 8. Salûl was a brother tribe of 'Âmir son of Şa'sa'ah: both were engaged in frequent contests and rivalries with the Benu-l-Hârith ibn Ka'b, and especially with the house of ed-Dayyân; see, for instance, Aghânî X, 145, where a story is told of a contest at 'Okâf between Yezîd son of 'Abd-el-Madân and 'Âmir son of Tufeyl for the hand of the daughter of Umayyeh son of el-Askar el-Kinânî, in which the former was victorious: also another (pp. 146-7) between the same Yezîd and the men of 'Âmir before one of the Ghassanide Kings. One of the battles between the Benu-l-Hârith and the Benû 'Âmir was the Day of es-Selef (Agh. X, 150): another was the Day of Feyf-er-Rîh (Ibn-el-Athîr, I, 474.)

v. 14. "Rain of the heaven", *ma'u-l-muzni*: literally, "water of a white rain-cloud": the sense is that they are as liberal as rain. *Mâ-es-Semâ*, "Water of the heaven," was a name given among the Arabs to men for their bounty and women for

their beauty. "One blunt of heart," *kaḥām*: the opposite of *maḍī*, cutting, keen, going straight to his end.

v. 18. "Days," *Ayyām*, is the word used in Arab legend for battles: one says—"the Day of el-Kulāb," "the Day of Shi'b Jebileh," &c., although the fight may (as it did at el-Kulāb) have lasted longer than one day. The second hemistich cannot be literally rendered into English. *Lahā ghurārūn ma'lūmatun wa ḥojūlu* means "They (i. e. our days) have wellknown *ghurar* and *ḥojūl*." *Ghurar* is the plural of *ghurrah*, a white blaze on the forehead of a horse; and *ḥojūl* is the plural of *ḥijl*, the original meaning of which is an anklet: then, of a horse, a white ring on the leg in the place of an anklet; as horses bearing such marks are conspicuous among a troop, so are the Days of his tribe glorious among days. So says 'Amr son of Kulthūm, using the same metaphor (Mo'all. 25.)—

وَ أَيَّامٌ لَّنَا غُرٌّ طَوَالٌ      مَصِينَا أَلْمَلِكَ فِيهَا أَنْ نَدِينَا

"Many the Days are ours, long, blazed with glory,  
when we withstood the King and would not serve him."

## VI.

Beshāmeh son of Ḥazn of Nahshal.

|                                               |                                                 |
|-----------------------------------------------|-------------------------------------------------|
| وَأِنْ سَقَيْتَ كِرَامَ النَّاسِ فَاسْقِينَا  | أَنَا مُحْيِيكَ يَا سَلْمَى فَحَيِّينَا         |
| يَوْمًا سِرَاةً كِرَامِ النَّاسِ فَادْعِينَا  | وَأِنْ دَعَوْتَ إِلَى جُلِيٍّ وَ مَكْرَمَةٍ     |
| عَفْءُهُ وَلَا هُوَ بِالْأَبْنَاءِ يَشْرِينَا | إِنَّا بَنَى نَهْشَلٌ لَا نَدْعَى لِأَبٍ        |
| تَلَقَّ السَّوَابِقَ مِنَّا وَالْمُصَلِّينَا  | إِنْ تُبَدَّرَ غَايَةٌ يَوْمًا لِمَكْرَمَةٍ     |
|                                               | وَلَيْمَسَ يَهْلِكَ مِنَّا سَيِّدٌ أَبَدًا      |
| وَلَوْ نُسَامُ بِهَا فِي الْأَمْسِ أُغْلِيذُ  | إِنَّا لَنُرْخِصُ يَوْمَ الرُّوعِ أَنْفُسَنَا   |
| نَاسُو بِأَمْوَالِنَا أَثَارَ أَيْدِينَا      | بَيْضَ مَفَارِقِنَا تَغْلِي مَرَاجِلِنَا        |
| قِيلُ الْكُمَاةِ إِلَّا أَيْنَ الْمُحَامُونَا | إِنِّي لَمِنْ مَعْشَرٍ أَنْفَى أَرَاثِلَهُمْ    |
| مَنْ فَارَسَ خَالَهُمْ إِيَّاهُ يَغْنُونَا    | لَوْ كَانَ فِي الْأَلْفِ مَنَّا وَاحِدٌ فَدَعَا |
| حَدَّ الطُّبَاةِ وَصَلَّنَاهَا بِأَيْدِينَا   | إِذَا الْكُمَاةُ نَحَّوْا أَنْ يُصِيبَهُمْ      |
| مَعَ الْبُكَاءِ عَلَى مَنْ مَاتَ يَبْكُونَا   | وَلَا تَرَاهُمْ وَإِنْ جَلَسَتْ مُصِيبَتُهُمْ   |
| عَنَا الْحِفَاظُ وَأَسْيَافُ تَوَاتِينَا      | وَنَزَكُ الْكُرَى أَحْيَانًا فَيَفْرِجُهُ       |

- We give thee greeting, O Selma : do thou give us greeting back !  
 and if thou givest the cup to the noblest, reach it to us.  
 And if thou callest one day to a mighty and valiant deed  
 the chiefest of noble men, let thy call go forth to us.  
 Sons of Nahshal are we : no father we claim but him,  
 nor would he sell us for any other sons.  
 When a goal of glory is set and the runners rush forth thereto,  
 of us shalt thou see in the race the foremost and the next.
- 5 And never there comes to die a mighty man of our line  
 but we wean among us a boy to be mighty in his stead.  
 Cheap do we hold our lives when the day of dread befalls,  
 but if we should set them for sale in peace, they would cost men  
 [dear.
- White are our foreheads and worn : for ever our cauldrons boil :  
 we heal with our rich store the wounds our hands have made.  
 I come of a house whose elders have fallen one by one  
 as they sprang to the cry of the fighters—' Where are the helpers  
 [now ?
- If there should be among a thousand but one of us,  
 and men should call—' Ho ! a knight ! ' he would think that they  
 [meant him.
- 10 When the fighters blench and quail before the deadly stroke  
 of the sword-edge, we leap forth and catch it in our hands.  
 Never shalt thou see them, though their loss be great and sore,  
 weeping among the weepers over him that is dead !  
 Many a time we bestride the steed of peril and death,  
 but our valour bears us back safe, and the swords that help us well.

## NOTES.

The metre of this piece is the same as that of No. I.

The tribe of Nahshal was a sept of Temim, of the division of Dârim. This poem is also attributed to a poet (some say the elder Muraqqish, but most mention no name) of the Benû Qeys ibn Tha'lebeh, a sub-tribe of Bekr ibn Wâ'il : those who follow this theory read in v. 3, instead of *innâ bent Nahshalin*, *innâ bent Mâlikin*, Mâlik of Qeys, the head of the family to which Tarafeh the poet belonged, being meant.

v. 4. The usual number of horses run in a race among the pagan Arabs was ten ; the one that came in first was called *es-sâbiq*, "the out-stripper," or *el-mujallih*, "he who makes [his owner] conspicuous" : the second, *el-muqallih*, "he whose head is at the tail (*qala*) of the foremost" : the third, *el-musallih*, "he who renders [his owner] content" : the fourth, *el-sâllih*, "the follower" : the fifth, *el-murtâh*, "the agile" : the sixth, *el-'âqif*, "he who bends his neck" : the seventh, *el-mu'ammal*, "he from whom much had been hoped" : the eighth *el-haqqiy* "the fortunate" (apparently by an euphemism) : the ninth, *el-lâ'lim*, "the cuffed," because he is driven away with blows from the paddock ; and the tenth, *es-sukuyt*, "the silent," because he is covered with confusion.

"The race for glory" is a metaphor often used by the old poets: thus Zuheyr (Ahlfardt, *Diwān*, p. 80) says—

إِذَا ابْتَدَرَتْ قَيْسُ ابْنِ عَيْلَانَ غَايَةً      مِنْ الْمَجْدِ مَنْ يَسْبِقُ إِلَيْهَا يُسَوِّدُ

"When the men of Qeys son of 'Eylān race together for a goal of glory, he that reaches it first is their chosen Lord."

v. 7. "White are our foreheads," *blāqum mafāriqumā*: this is variously interpreted; it is said that it may either mean that their heads are crowned with glory as with light, or that they have become bald by constantly wearing the helmet: the latter explanation seems best. The boiling of the cauldrons is also explained in two ways; it is said that it is a metaphor for the heat and fury of war: but the better and simpler interpretation refers it to their ever open hospitality. "We heal with our 'rich store': that is, "when any one is slain by us we pay from our herds the price of his blood."

v. 9. This resembles a line of Ṭarāfeh's (*Mo'all*, 42)—

إِذَا الْقَوْمُ قَالُوا مَنْ فَبَيْ خَلْتُ أَنْتَنِي      عُنَيْتُ فَلَمْ أَكْسَلْ وَلَمْ أَتَبَلَّدْ

"When my kinsmen cried 'Who is the man for the deed?' I deemed that I was he they meant: and I lagged not nor was I infirm of heart."

## VII.

|                                      |                                          |
|--------------------------------------|------------------------------------------|
| لَقَتَيْلًا دَمُهُ مَا يَطْلُ        | لِنْ يَالِ شَعْبِ الَّذِي دُونَ سَلْعٍ   |
| أَنَا بِالْعَبَاءِ لَهُ مُسْتَقْلٌ   | خَلْفَ الْعَبَاءِ عَلَى رُوْلِي          |
| مَصْعَ عَقْدَتِهِ مَا نُحَلُّ        | وَرَاءَ النَّارِ مَنَى ابْنِ أُخْتِ      |
| رَقَ أَفْعَى يَنْفُثُ السَّمَّ مَلٌ  | مُطْرَقٌ يَرْشَحُ سَمًا كَمَا أَطُ       |
| جَلَّ حَتَّى دَقَّ فِيهِ الْأَجَلُ   | خَبِرَ مَا نَابَنَا مُصْمَلٌ             |
| بَابِي جَارُهُ مَا يُدَلُّ           | بَزَنِي الدَّمَرُ وَكَانَ غَشُومًا       |
| ذَكَتِ الشَّعْرَى فَبَدَّ وَظَلُّ    | شَامِسٌ فِي الْقَرْحَتِي إِذَا مَا       |
| وَنَدَى الْكَفَيْنِ شَهْمٌ مَدَلُّ   | يَابِسُ الْجَنْبَيْنِ مِنْ غَيْرِ بَوَسٍ |
| حَلَّ حَلَّ الْحَزْمِ حَيْثُ يَحُلُّ | ظَاعِنٌ بِالْحَزْمِ حَتَّى إِذَا مَا     |
| وَإِذَا يَسْطُو فَلَيْتُ أَهْلُ      | عَيْتُ مَزْنٍ غَامِرُ حَيْثُ يَجْدِي     |
| وَإِذَا يَغْزُو فَتَمِيعُ أَرْلُ     | مُسْبِلٌ فِي الْحَيِّ أَحْوَى رَفْلُ     |

وَ لَهُ طَعْمَانِ أَرِي وَ شَرِي      وَ كَلَا الطَّعْمِينَ قَدْ ذَاقَ كُلُّ  
 يَرْكَبُ الْهَوَلَ وَحِيدًا وَلَا يَصْ—حَبَّهُ إِلَّا الْيَمَانِي الْأَنْلُ  
 وَفَنُو هَجَرُوا ثُمَّ اسْرُوا      لَيْلَهُمْ حَتَّى إِذَا انْجَابَ حَلُوا  
 كُلُّ مَاضٍ قَدْ تَرَدَّى بِمَاضٍ      كَسْنَا الْبَرْقِ إِذَا مَا يُسَلُّ  
 فَاحْتَسَرُوا أَنْفَاسَ نَوْمٍ فَلَمَّا      هَرَمُوا رَعِمُوا فَاشْمَعُوا  
 فَادْرَكْنَا الدَّارَ مِنْهُمْ وَ لَمَّا      يَنْجُ مِنْ خَيْبِ الْأَوَّلِ  
 فَلَنْ فَلَتْ هَدَيْلُ شَبَاهُ      لَيْمًا كَانَ هَدَيْلُ يَغْلُ  
 وَبِمَا أَهْرَكَهَا فِي مَنَاحٍ      جَعَجَعَ يَنْقُبُ فِيهِ الْأَظْلُ  
 وَبِمَا صَبَحَهَا فِي ذَرَاهَا      مِنْهُ بَعْدَ الْقَتْلِ نَهَبٌ وَشَلُّ  
 مِنْ يَ هَدَيْلُ بَخَرِي      لَا يَمَلُ الشَّرَّ حَتَّى يَمَلُوا  
 يُنْهَلُ الصَّعْدَةُ حَتَّى إِذَا مَا      نَهَلَتْ كَانَ لَهَا مِنْهُ عِلُّ  
 خَلَّتِ الْخُمْرُ وَكَانَتْ حَرَامًا      وَ بِلَايَ مَا أَلَمَّتْ نَحْلُ  
 فَاسْقَظِيهَا يَا سَوَادَ بَنِ عَمْرٍو      نَ جَسْمِي بَعْدَ خَالِي لَحْلُ  
 فَسَقِظَا كَأْسَ حَنْفٍ هَدَيْلًا      غَبَهَا خَزْيٌ وَ عَارٌ وَ ذَلُّ  
 تَضْحِكُ الضَّبْعُ لِقَتْلَى هَدَيْلُ      وَ تَرَى الدَّئِبَ لَهَا يَسْتَهْلُ  
 وَ عَنَاقُ الطَّيْرِ تَهْمُو بِطَانًا      تَتَخَطَّاهُمْ فَمَا تَسْتَقِلُّ

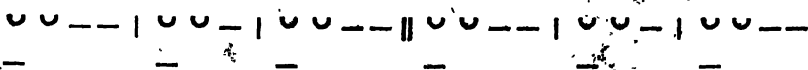
In the cleft of the rocks below Sal' is lying  
     one slain whose blood drips not without vengeance.  
 He left the burden to me and departed,  
     and I take up the load lightly and bear it—  
 A heritage of bloodshed to me the son of  
     his sister, one dauntless—his knot none looses,—  
 Downcast of eyes, dripping poison, like as  
     the hooded asp that spits venom, the adder.

- 5 Fearful the tidings that reach us, heavy—  
the heaviest of burdens thereby is nothing !  
Fate has cut off from me, Fate the tyrant,  
one mighty whose friend none dared to be little :  
A sunshine in wintertide, until when  
the Dogstar burned, he was coolness and shadow :  
Lean-sided and thin, but not from lacking :  
liberal-handed, keen-hearted, haughty ;  
He journeyed with Wariness, and where he halted,  
there Wariness halted herself his comrade :
- 10 A rushing rain-flood when he gave guerdons :  
when he sprang to the onset, a mighty lion ;  
In the midst of his kin flowed his long black hair, and  
his skirts trailed : in war a wolf's whelp with lean flanks ;  
Two savours had he, of honey and gall : and  
one or the other all men have tasted ;  
He rode Fear alone without a fellow  
but only his deep-notched blade of el-Yemen.  
Many the warriors, noon-journeying, who, when  
night fell, journeyed on, and halted at dawning—
- 15 Keen each one of them, girt with a keen blade  
that when one drew it flashed forth like the lightning—  
They were tasting of sleep by sips, when as  
they nodded, thou didst fright them, and they were scat-  
tered !  
Vengeance we did on them : there escaped us  
of the two houses none but the fewest.  
And if Hučeyl broke the edge of his sword-blade—  
many the notch that Hučeyl gained from him !  
Many the time that he made them kneel down on  
jagged rocks where the hoof is worn with running :
- 20 Many the morning he fell on their shelter,  
and after slaughter came plunder and spoiling.  
Hučeyl has been burned by me, one valiant  
whom Evil tires not though they be wearied—  
Whose spear drinks deep the first draught, and thereon  
drinks deep again of the blood of foemen.  
Forbidden was wine, but now is it lawful :  
hard was the toil that made it lawful !  
Reach me the cup, O Sawâd son of 'Amru :  
my body is spent with gaining my vengeance.
- 25 To Hučeyl we gave to drink Death's goblet,  
whose dregs are disgrace and shame and dishonour.

The hyena laughs over the slain of Huḏeyl, and  
the wolf—see thōu—grins by their corpses,  
And the vultures flap their wings, full-bellied  
treading their dead, too gorged to leave them.

## NOTES.

The measure is the *Medâ*, the basis of which is a pair of ionics a *minor* separated by an anapaest:—



This poem stands in the *Hamâseh* under the name of Ta'abbata Sherrâ; but it is also attributed to Ta'abbata's sister's son, and held to refer to the vengeance wrought by the nephew on his uncle's slayers. The commentators, however, say that the slain man cannot be Ta'abbata himself, for Sal', the place named in the first verse, is in the neighbourhood of el-Medîneh: but the place where Ta'abbata was slain lay in the country of Huḏeyl, eastward of Mekkeh, and was called Rakhmân. His sister said, bewailing him—

نَعَمْ الْفَتَى غَادَرْتُمْ بِرَحْمَانٍ      بَنَاتِ ابْنِ جَابِرِ ابْنِ سُفْيَانَ  
مَنْ يَقْتُلُ الْقِرْنَ وَيُرِي الدِّمَامَ

"Fair was the warrior whom ye left in Rakhmân  
—Thâbit son of Jâbir son of Sufyân,  
Who slew his foe and poured wine for his fellow!"

(Thâbit son of Jâbir was the real name of Ta'abbata Sherrâ, which means "He carried evil under his arm.")

But the weight of evidence is against the authenticity of the poem as an utterance of Ta'abbata's; it is more probably attributed to the famous imitator of the songs of the pagan Arabs, Abû Mohriz ibn Hayyân, commonly known as Khalaf el-Ahmar. This man was a native of Farghâna, and was taken captive with his parents when Khurâsân was conquered by the Muslims; he grew up to be a most eminent man of learning, and among all those of that class, who abounded in the days of the first 'Abbâsî Khalîfahs, he was the truest poet. He is best known as a fabricator of poems in the style of the ancients, with which he deceived the learned men of el-Kûfeh, and even Hammâd er-Râwîyeh himself; he afterwards acknowledged the poems to be forged, but they refused to believe it. He died about A. H. 180. (Ibn Quteybeh, Ma'ârif, p. 270. Id. in Nöldeke's Beiträge zur Kenntniss d. Poes. d. alt. Arab. p. 15. Ibn Khallikân, I. p. 571, and III. p. 391. Aghânî V. 174.)

The following are some of the marks of a late origin (*âkhar et-tawliâ*) which are to be found in the piece:—

The subtlety of the thought conveyed in the words of verse 5, b, — *jella ḥatta daqqa fli-l-ajllu*: this struck the ancient commentators as unlike the speech of a Desert Arab:

The play of words in verse 8 between *yâbiu-l-jomboyri* (dry-sided, i. e. lean) and *medi-l-kaffoyri* (moist-handed, i. e. liberal):

The alliteration in v. 9, where out of ten words seven contain the letter *Ṣ* :

The alliteration of *gheythu* and *ghāmīrun* in v. 10, and the rhyming antithesis of *gheyth* and *leyth* (besides *heyth* in the same verse) :

The very unusual distributive sense of *kilā* in v. 12 :

The use of *injāba* in v. 14 for the dawn : it appears to be used in classical Arabic only for the clearing away of clouds ;

The play on the word *māḍīn* in v. 15, where it means (1) a warrior who goes straight to his end, and (2) a sword that cuts through all obstacles.

None of those taken by itself would perhaps be conclusive ; alliteration is not unknown in the ancient poetry, but it is not approved ; and instances of word-play might also be found. But taken together they constitute what is called *tekelluf* (which may be rendered *artificiality*), which is foreign to the age to which the poem would belong if it were really by Ta'abbata Sherrā.

But whether an imitation or a genuine old poem, there can be no doubt that the piece breathes the true spirit of the pagan Arab. Albert Schultens says of it—"Nobile hoc carmen . . . monumentum est illustro laudationum quibus Fortium fortia facta concelebrari solebant. Magnis splendet ornamentis ac luminibus, quæ gentis genium graphice pingunt." Goethe, in the Appendix to his West-Oestlicher Diwan (where he gives a translation of it, rendered from Schultens' Latin, as the only specimen of old Arab poetry which he adduces), writes — "Die Grösse des Characters, der Ernst, die rechtmässige Grausamkeit des Handelns, sind hier eigentlich das Mark der Poesie . . . Höchst merkwürdig erscheint uns bei diesem Gedicht, dass die reine Prosa der Handlung durch Transposition der einzelnen Ereignisse poetisch wird.<sup>1</sup> Dadurch, und dass das Gedicht fast alles äussern Schmucks ermangelt, wird der Ernst desselben erhöht, und wer sich recht hinein lies't muss das Geschehene, von Anfang bis zu Ende, nach und nach vor der Einbildungskraft aufgebaut erblicken."

vv. 1 to 4 tell of the slaying, and set before us the avenger : vv. 5 to 13 praise the slain man, his mighty deeds and great heart : vv. 14 to 17 describe the onslaught which led in the end to his fall : vv. 18 to 20, the many deeds of daring which Huḏeyl had to avenge on him ; vv. 21 to 27, the vengeance taken by him into whose mouth the poem is put.

v. 1. "Drips not without vengeance," *mā yufallu* : literally, "is not poured forth like the dew or fine rain."

v. 3. "A heritage of bloodshed to me the son of his sister", *wa ward'a-ih-tha'ri minni-bnu ukhtin* : literally, "and behind the vengeance" (i. e., to take it up—a continuation of the thought of verse 2) [there is] "a sister's son in me." This verso has been misunderstood by Schultens and Rückert : the former renders it—"Post me talioni imminet sororis filius," and the latter—"Und ein Schwwestersohn zur Rache tritt mir nach." Goethe, seeing with a fine discernment that the avenger who speaks is himself the sister's son of the dead, (compare verso 24—*inna jismt ba'da Khālī lakhallu*), makes verses 3 and 4 the reported utterance of the dying man—

"Erbe meiner Rache  
Ist der Schwwestersohn,  
Der Streithare,  
Der Unversöhnliche," u. s. w.

*Minni* is here an example of the explicative *min* (*li-l-bayān*).

"His knot none looses," *oḡdatuhu lā tohallu*, said of a man whose fury in battle is

irresistible: the dictionaries give *taḥallelet 'oqaduhu* as meaning "his anger was appeased."

v. 4. The comparison of the warrior to a deadly serpent in this verse recalls the name of the family in Teghlib to which 'Amr son of Kulthūm belonged—the *Arāqim*—"the spotted serpents."

v. 5. "The heaviest of burdens thereby is nothing": literally—"it is great (i. e. terrible) so that the greatest therein becomes little"; the criticism of the earlier commentators on this phrase has been mentioned above.

v. 6. "Whose friend," *ḡarūhu*: see the note to v. 5 of No. V.

v. 7. "A sunshine," *shāmis*: literally, "a sunny day."

v. 8. "Lean-sided": leanness is a subject of praise in a hero because it denotes the hardships he has undergone, and also his generosity in giving to others to eat while he keeps nought for himself.

v. 11. The first hemistich of this verse can be taken in two ways: either *musbilum* may be rendered absolutely, "letting hang down," i. e., his garments: and *ahwad* may be taken of his complexion, "swarthy"; or, as I have rendered it, *ahwad* may be the accusative after *musbilum*, "letting hang down his long black [hair]." "His skirts trailed": in days of peace and quiet the Arabs allowed their *isār* or waist-wrapper to trail on the ground: in war they girt it tight about their loins. Zuheyr says, describing a luxurious people (Ahlwardt, *Six Poets*, p. 77):—

|                                             |                                       |
|---------------------------------------------|---------------------------------------|
| تَعَلَّ بِهٖ جُلُودُهُمْ وَ مَاءُ           | لَهُمْ رَاحٌ وَ زَارِقٌ وَ مَسْكٌ     |
| حَمِيًّا الْكَلَسُ فَيْبِهِمُ وَ الْغَدَاءُ | يَجْرُونَ الْبُرْدَ وَ قَدْ تَمَشَّتْ |

"By them is wine, and a strainer, and musk thereby  
wherewith their skins are perfumed, and water:  
They trail their skirts of *burd*, and in them glows  
the vehemence of the cup and the ecstasy of song."

(Water, to mix with the wine: so wine was commonly drunk by the Arabs: see Ṭarāfeh, Mo'all. 59, and 'Amr Kulth. Mo'all. 2).

"A wolf's whelp," *sim*, a hybrid between the wolf and the hyena, with the fierceness of both.

v. 12. "Gall", *sharyun*, the colocynth or bitter gourd.

v. 14. The mode of journeying in the Desert hero described will be familiar to all readers of Palgrave's "Central and Eastern Arabia."

vv. 16, 17. In et-Ṭebrizī's edition of the Ḥamāsah these verses stand in the reverse order: the sequence in which I have given them is that in which they are placed by Schultens, and seems the natural one.

"They were tasting of sleep by sips," *iḥtasau anfḡaa naumin*: i. e., sleep was overcoming them little by little.

v. 18. "Broke the edge of his sword blade," *fellet shabāhu*: that is, apparently, overthrew him.

v. 21. "Huḡeyl has been burned," *ḡaliyet*, i. e., scathed. So el-Ḥārith son of 'Obād, when he was unwillingly compelled to take part in the contest by the slaying of his son Bujeyr by Muhelhil, said of the War of Basūs—

لَمْ أَكُنْ مِنْ جُنَاتِهَا عِلْمَ اللَّهِ وَإِنِّي بِسَرِّهَا الْيَوْمَ مَالٍ

"I was not of those whose wrong wrought it, God knows!

Yet to-day must I be burned in its blaze."

v. 22. "He drank deep at the first draught" (*nahila*) and "he drank deep a second draught" (*alla*), both words used originally of camels, are in constant use in Arab poetry to describe the thrust and thrust again of spears.

v. 23. Wine was forbidden to him, because he had sworn not to drink it until he attained to his vengeance.

v. 25. This verse is omitted in Freytag's edn. of et-Tebrizī's *Hamāseh*: I have restored it from Schultens' text, because it appears to arise naturally out of the idea of the preceding verse.

v. 27. "The vultures," *ḥaḍaq-t-ṭeyri*: literally, "the noble of birds," a term reserved for birds of prey. "Flap their wings," *tahfū*: this is the reading of Schultens, and is also given by et-Tebrizī in the commentary, though he admits *teghdū* into the text; the former reading seems to me to give much greater vividness to the horrible picture than the latter, which is a mere auxiliary verb.

### VIII.

Ishāq son of Khāḍaf.

لَوْلَا أُمَيْمَةُ لَمْ أَجْزَعْ مِنَ الْعَدَمِ وَلَمْ أَتَأَسِ الدَّجَى فِي حِنْدَسِ الظُّلَمِ  
وَزَادَنِي رَغْبَةً فِي الْعَيْشِ مَعْرِفَتِي ذُلَّ الْيَتِيمَةِ يَجْفُوها ذُرُّ الرَّحِمِ  
أَحَازِرُ الْفَقْرَ يَوْمًا أَنْ يُلْسِمَ بِهَا فِيهِنَكَ السُّرَّ عَنْ لَحْمٍ عَلَى وَصْمِ  
تَهْوِي حَيَانِي وَأَهْوَى مَوْتَهَا شَفَقًا وَالْمَوْتَ أَكْرَمُ نَزَالٍ عَلَى الْحَرَمِ  
أَخْشَى فَطَاظَةً عَمَّ أَوْ جَفَاءَ أَخٍ وَكُذْتُ أَبْقَى عَلَيْهَا مِنْ أَدْبَى الْكَلِمِ

If no Umeymeh were there, no Want would trouble my soul—  
no labour call me to toil for bread through pitchiest night;

What moves my longing to live is but that well do I know  
how low the fatherless lies,—how hard the kindness of kin.

I quake before loss of wealth lest lacking fall upon her,  
and leave her shieldless and bare as flesh set forth on a board.

My life she prays for, and I from mere love pray for her death—  
yea, death, the gentlest and kindest guest to visit a maid.

5 I fear an uncle's rattle, a brother's harshness for her;  
my chiefest end was to spare her heart the grief of a word.

## NOTES.

The metre is the first form of the *bestī*, in which the last foot is the same in the second hemistich as in the first; an attempt has been made to imitate it in the translation. The grammars give  $\cup - \cup$  — as permissible for the third foot, although on an examination of a large number of pieces of this measure in the Ḥamāseh I have found no example of a short first syllable; instances, however, occur elsewhere; see en-Nābighah, v. 34 and 49, and xi. 3. Zuheyr, ix. 18, 21, 22. In the English, owing to the want of clear distinction between syllables long in themselves (apart from the accent) and short, it has not been found possible always to give a long syllable in this place.

Of the author of these lines I have been able to ascertain nothing. The fragment is, as shown by the rhyme in the first hemistich, the beginning of a *qasidah*; four more lines of the same measure and rhyme are given as a continuation of the piece in the Appendix to the Calcutta Edn. of the Ḥamāseh, p. 221; but they are of inferior merit to those selected by Abū Temmām. By his name (Ishāq) the author should be an Islāmī; the only authentic instance of a biblical name born by an Arab (not a Jew) before el-Islām is that of the great-great-grandfather of 'Adī son of Zeyd el-'Ibādī, who was called Ayyūb (Job). (See Aghānī ii. 18, and Abu-l-'Alā, quoted in the Ḥamāseh, p. 177). The sentiment of v. 4 is, however, rather pagan than Islamic.

v. 3. "Meat on a butcher's board" is a proverbial expression for that which is utterly defenceless and helpless.

v. 4. The scholiast compares the proverbs (both current in the Ignorance) *ni'ma-l-khatanu-l-qabru*, "An excellent son-in-law is the Grave," and *defnu-l-banāt mina-l-mekrumāt*, "To bury daughters is an act of mercy"; the reference in the latter is to the practice of burying female children alive immediately after birth, which was still prevalent (though not widely spread) among the pagan Arabs at the time of the Prophet's mission. The lot of women among the Arabs of the Ignorance was a hard one; and it is most probable that the practice in question was perpetuated, if it did not begin, in the desire to save the family the shame of seeing its women ill-used or otherwise disgraced. This is to be inferred from the account given in the Aghānī (xii. 150) of the reason why Qays son of 'Āsim, a lord of the tribe of Temīm, adopted it. To this man was due the revival of the custom in the Prophet's time after it had almost died out; a terrible tale is told of his burial alive of the only one of his daughters who was saved at birth and brought up in another family unknown to him.

v. 5. The use of the imperfect (*kuntu ubqt*) in the second hemistich of this verse is worth noticing. The speaker looks forward to the time when his daughter will be left fatherless, and find no love such as that which she found in him.

## IX.

Hiṭṭān son of el-Mo'allā.

أَنْزَلَنِي الدَّهْرُ عَلَى حُكْمِهِ      مِنْ شَامِخٍ عَالٍ إِلَى خَفَضٍ  
وَعَالَنِي الدَّهْرُ بِبَغْيِ الْغَنِيِّ      فَلَيْسَ لِي مَالٌ سِوَى عِرْضِي  
أَبْكَنِي الدَّهْرُ وَبَكَتْ بَنَاتِي      أَضْحَكُنِي الدَّهْرُ بِمَا يُرْضِي  
لَوْلَا بَنَاتُكَ كَرَمٌ أَقْطَا      رُدَدَنَ مِنْ بَعْضٍ إِلَى بَعْضٍ

لَكَانَ لِي مُضْطَرَبٌ وَاسِعٌ فِي الْأَرْضِ ذَاتِ الطُّولِ وَالْعَرْضِ  
وَأَنَا أَرْلَادُنَا بَيْنَنَا أَبْهَدُنَا تَمْشِي عَلَى الْأَرْضِ  
كُوْهَبَتِ الرِّيحِ عَلَى بَعْضِهِمْ لَمْ تَنْعَتْ عَيْنِي مَنِ الْغَضِ

Fortune has brought me down (her wonted way)

from station great and high to low estate ;

Fortune has rent away my plenteous store :

of all my wealth honour alone is left ;

Fortune has turned my joy to tears: how oft

did Fortune make me laugh with what she gave!

But for these girls, the Qaṭa's downy brood,

unkindly thrust from door to door as hard—

5 Far would I roam and wide to seek my bread

in Earth that has no lack of breadth and length ;

Nay, but our children in our midst, what else

but our hearts are they walking on the ground ?

If but the wind blow harsh on one of them,

mine eye says 'nó to slumber all night long.

## NOTES.

The metre is the third form of the *Sari'*, and consists of two diiambbs (each commutable to — —  $\cup$  — and —  $\cup$   $\cup$  —) followed by a cretic (—  $\cup$  —); in the second hemistich, which is catalectic, the cretic becomes a spondee:—

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Of the poet I have ascertained nothing.

v. 4. The *Qaṭa* is the sand-grouse; it is most probably identical with the Hebrew *Qā'ath* (A. V. "pelican").

The second hemistich of this verse has strangely perplexed the commentators. The following is a translation of et-Tebrizi's note upon it. "*Rudidna min ba'din ila ba'di* means—'They were gathered together to me in a brief space of time, one born of a second wife after another born of the first, one by the side of another.' Another reading is *rededna min ba'din ila ba'di*, with the active form of the verb and the personal pronoun joined to the *second ba'd*; the meaning of this would be 'they have bowed me and bent one part of ~~my~~ back towards another.' Or, if we adopt the first reading, the line may mean that these daughters of his had been wedded, and were turned away together with their little girls; *mardudeh* is used in the sense of a divorced woman, and *ila* is sometimes equivalent to *ma'* (together with): you say *hata ila daka* ('this with that') meaning *ma'a daka*; taking it in this way, *min ba'din ila ba'di* will be in the place of the accusative of condition in *rudidna*, i. e., they have been divorced together

with their children.' Or you may read *rudidna* as before, and *min ba'di ilā ba'di*, giving both the *ba'di* the affixed pronoun; the sense would then be 'They were in my loins, and when I begot them they entered (were turned) into my heart, which burns by reason of them through excess of affection.' Another reading is *jumi'na min ba'din ilā ba'di* [the sense of which would be the same as the first explanation given by et-Tebrizi]. Abū Hilāl says: '*rudidna min ba'din ilā ba'di* is a sentence which hides but little meaning: perhaps he intended to say that they were born from different mothers, and were thrust from one to the other: but he did not express himself plainly.' "

So far et-Tebrizi; it appears to me that the difficulty (which consists in the use of the past, *rudidna*, for the future which the poet contemplates for his daughters, and which has led the commentators to try to explain that verb as referring to something already past) may be solved by supposing that the speaker puts his anticipation in the form of an event already come to pass. Such a construction is the common one for optatives, (*jezdhu-llah*, &c.,) and is so used in places where there can be no question of the theological explanation which refers it to the foreknowledge of God, to whom futuro is as past; see e. g., *Hamāseh*, p. 67.—

بَقِيَتْ وَقُرْبِي وَأَنْحَرْتُ عَنِ الْعُلَى وَلَقِيتُ أَهْيَافِي بِوَجْهِ عَبُوسٍ

Then, again, there are many instances in which what is spoken of as a past event is explained as a future one, e. g., in *Ham*, p. 172.—

أَنْفِي فِي أَرْضِ فَارِسٍ مُوْتَقٍ أَحْوَالًا

where the commentary (perhaps needlessly) understands that the poet, in his foreknowledge of what awaits him, speaks of it as already come to pass. So also in *Ham*, p. 252, Jahdar son of Dube'ah says—

قَدْ يَتِمَّتْ بِنْتِي وَآمَتْ كُنْتِي

plainly referring to a bereavement and widowing which are to be after his death in the fight before engaging in which he utters the verses. Those instances seem amply to justify us in understanding the words in their natural sense—"pushed (or thrust) from one to another without help or kindness"; nothing could be more far-fetched than all the explanations given by et-Tebrizi.



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(Nos. I to IV.—1877.)

EDITED BY  
THE NATURAL HISTORY SECRETARY.

~~~~~  
"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease." SIR WM. JONES.
~~~~~

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1877



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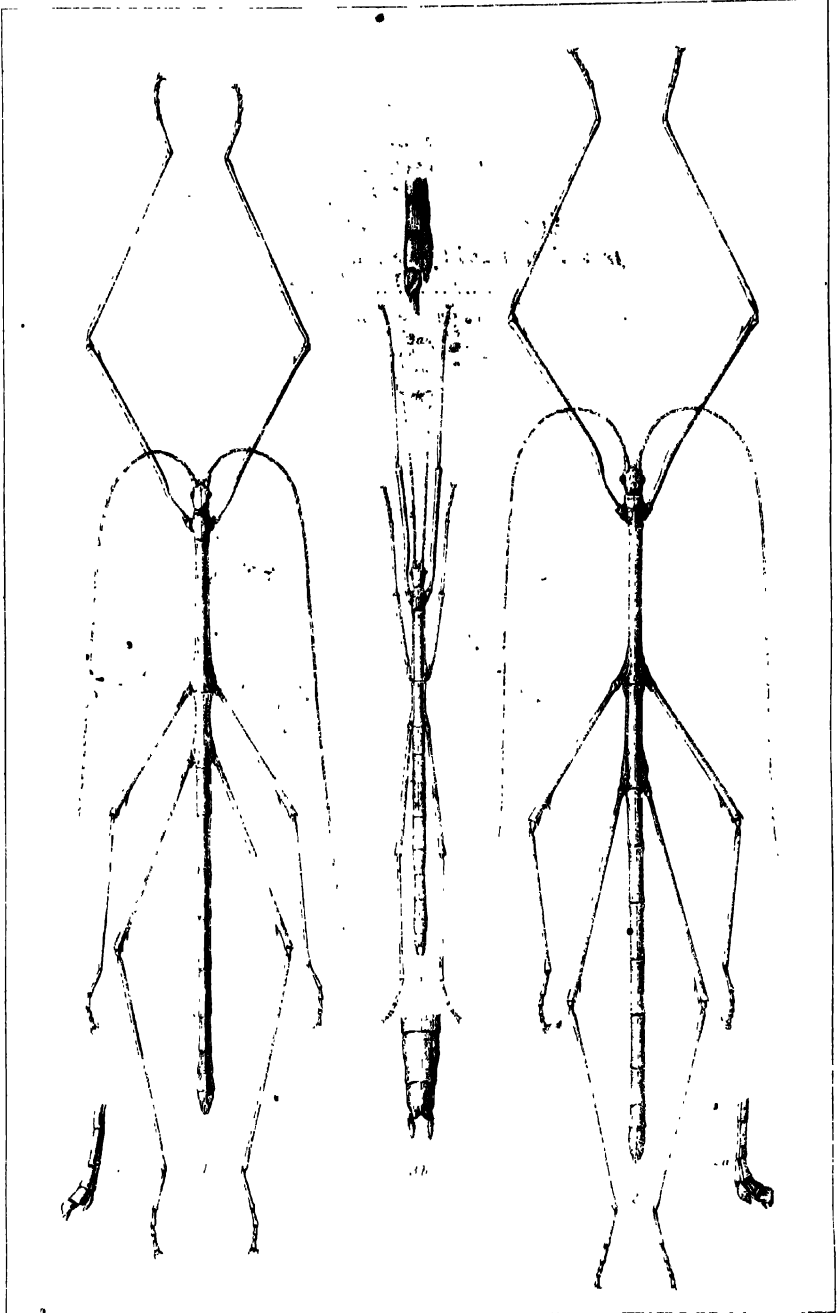
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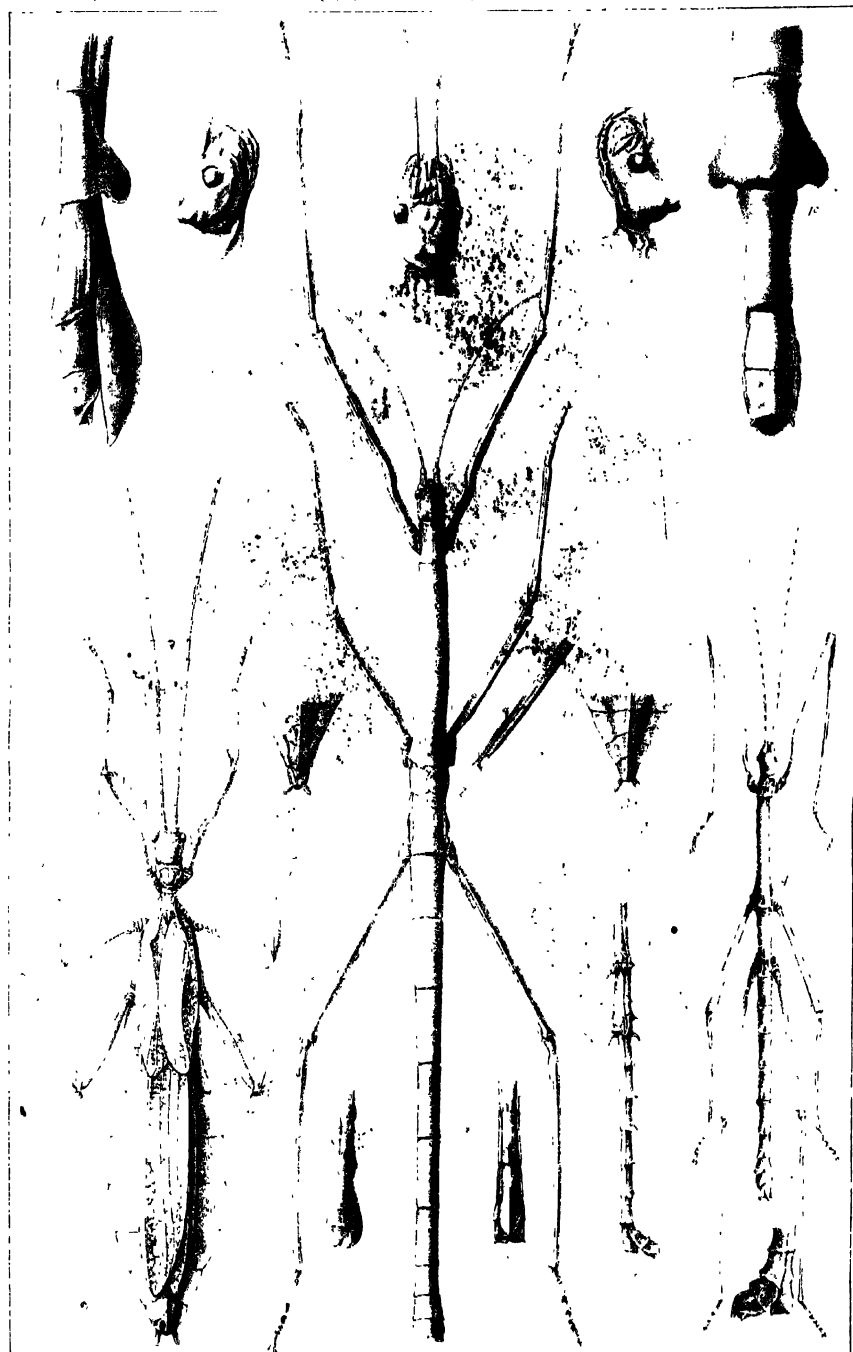
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- No. II.—Containing pp. 49—258,—was issued on 2nd August, 1877.
- No. III.—Containing pp. 259—314,—with Plate 1,—issued on 27th December, 1877.
- No. IV.—Containing pp. 315—355,—with Plates 2, 3, 4.—issued on 20th April, 1878.
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# JOURNAL

OF THE

## ASIATIC SOCIETY OF BENGAL.

Part II.—PHYSICAL SCIENCE.

No. I.—1877.

I.—On *Himalayan Glaciation*.—By J. F. CAMPBELL, Esq., F. G. S.

(Read January 17th, 1877.)

[We so seldom have the advantage of foreign opinion upon matters of scientific observation in India, that the Society will no doubt welcome the following notes upon Himalayan glaciation addressed to one of its Secretaries by Mr. J. F. Campbell, so well known for his remarks upon ice-action in every quarter of the northern hemisphere. The notes are left in their epistolary form, which is so well suited to communications that do not pretend to be exhaustive.]




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*Kotleh, November 19th, 1879, Kangra valley.*

MY DEAR SIR,—On the 27th Sept. I landed with you at Bombay. By your advice I have come here to look at certain marks supposed to be glacial. Let me refer you to the second volume of '*Frost and Fire*' for marks which I had recognized when that book was printed. Let me refer you to '*My Circular Notes*.' (Macmillan 1875) for references to other papers of mine on glacial subjects, and for the result of my observations during thirty-five years. From these writings you may estimate my knowledge of glacial marks and my opinion.

1. I have now skirted the base of the Himalayas from Hirdwar to Lahore. In the plains of Europe and of North America, I have seen large stones, carried great distances from parent rocks, say from a thousand to fifteen hundred miles, over plains. These commonly are smoothed, polished, and grooved, exactly like stones which are found beneath existing glaciers. These erratics reach as far south as icebergs now float in the

Atlantic, namely, to Lat. 37° N. in America. I have not seen one large stone in the plains of India so far as I have travelled, except stones carted and carried by men for building purposes. Of these not one was striated.

2. I have been to Simla, and to "Monsuri" (so named by the people), and for short distances inland. In Scotland, Scandinavia, the Alps, and in North America; in Labrador, and in Vancouver's Island: in all northern countries where marks of ancient glaciations abound, and where I have travelled to study them; I have seen rocks and mountains of a particular rounded form, on which grooves mark out the course of the ancient glaciers or icebergs which moved over these rocks and rounded them. In Scandinavia horizontal grooves are visible on the large scale from end to end of fjords more than a hundred miles long, to a height of more than a thousand feet above the sea level. All the rocky islands which stud the Norwegian coast are striated, and to considerable heights, and great blocks of transported stone are pointed out on the hill-tops everywhere. Many of these erratics are angular blocks, as big as small houses. In 1841, I slept under a stone of this kind with fifteen other persons, guides and travellers, upon an Alpine glacier. Such stones abound in Scotland, and in Ireland, some as high as three thousand feet, and rest upon the tops of isolated mountains. I have not seen one "perched block" in the lower Himalayas, nor have I seen one hog-backed ridge  or one rounded valley . I have seen every where far and near, with my telescope, and at my feet a constant repetition of the form  which I attribute to the action of running water, *not* to glacial action.

3. I went to Hirdwar, to the exit of the Ganges from the basin in which that river and its branches take their rise in glaciers. I have photographs of these glaciers. In all the glaciated countries that I have visited, the ends of great basins of this kind are abundantly strewed with glaciated stones. I sought carefully from Deira to Hirdwar, and from Hirdwar to Roorkee along the Ganges canal, and I did not find one glaciated stone there.

4. It sometimes happens that large glaciated stones are found in rocks consolidated, and classed geologically as old rocks;—"old red sandstone," &c. I have looked at the "Siwaliks," at the rocks which contain fossils of large extinct animals. I have not seen one glaciated stone in these beds. The fauna of the Siwaliks &c. as described in books, indicate a warm climate, like that which now exists here, and do not indicate anything glacial.

5. From Pathankote (here named "Puttānkote") to Nurpur, I crossed the mouth of a wide valley in which are several large rivers which take their rise amongst glaciers according to the maps. I saw nothing glacial on that stage. These streams drain the northern slopes of the Kangra range.

6. From Nurpur to this place I have crossed several rivers, which descend from the southern face of a snowy range behind which rivers flow which I crossed yesterday. The range is some 12 or 13,000 feet higher than my road, according to the maps, and the top of it is distant about 12 or 13 miles. I have seen a vast number of large stones near these rivers. I have not seen one stone or one exposed rock surface with any mark of glaciation along my route thus far. Several large stones, some of granite, are below this house. Their surfaces are well preserved, and they are all dented by rolling, not striated by sliding.

7. Where rivers are cutting through old moraines, they constantly undermine and wash out glacial stones. A small rivulet near Dunrobin in Sutherland is full of large stones washed out of an old moraine of large size. The plain rivers near Chicago in America also wash out large glaciated boulders which come from the old Lake Superior. I have seen no such stone here, and nothing that has the remotest resemblance to any moraine that I ever saw anywhere. That about a thousand feet in a mile, and the vast rainfall of these regions suffice to explain the transport of far larger stones than any which I have seen thus far in India. A very large stone was moved more than a hundred yards this year at Kalka, by the small river which there enters the plains. The stone was known because it had long been used as a washing stone. The fact was remembered because two washermen were carried away and drowned by a sudden flood. The slope at Kalka is far less than the slope here. Thus far I have seen nothing to suggest the action of ice at low levels between Hirdwar, and Lahore, Pathankote and Kotleh.

8. So far as I can see now, my distant observations from Simla with a telescope, are confirmed by detailed examination of this ground.

9. I say nothing of that kind of geology which belongs to professional men. I see enough to convince me that there is professional work on this ground for many expert geologists for many years. But generally it seems to me, that a part of the plain, formed of old as the plain is now forming, has been crumpled up against the older rocks, probably by a thrust. I saw a folded section in the right bank of the river at Nurpur yesterday with an expiring camel on the shingle to shew how "siwalik" fossils got buried of old by streams like those which now flow into the plains. They form "Deltas"  $\Delta$  or, if the new name is preferred fans, which now extend ten or twelve miles into the plains. These commonly spread till they meet so that a whole series make something like a continuous formation whose section must vary with the intermittent flow of rivers. Such a section of alternate beds of pebbles, shingle, sand, and brown mud I have seen in crossing the crumpled rocks which are named "Siwaliks" and "Nahuns" (?) hereabouts, and near Deiradun, I have no geological map,

and a passing traveller cannot hope unaided to unravel the complications of beds which I see here. I saw another folded E.—W. section to-day in a river bank. I do not therefore concern myself with that kind of geology which belongs to your department. I confine myself to marks of glaciation with which I have made myself familiar. About Lat.  $30^{\circ} 31'$  I have found none in India thus far.

10. I have looked carefully for sea-margins along the foot of hills. All round Scandinavia, in Scotland, in "the Labrador", and in many other countries, "terraces" nearly parallel to the existing sea level mark old sea levels before the land was last raised. The form is very conspicuous, and the cause of it is often manifested by the discovery of recent shells in the sand and mud in which they died. I looked from Pathankote westwards, and saw the outline of the hills fade gradually into the plains at an angle of about five degrees. There was no semblance of a raised sea margin towards Kashmir. ~~I have seen~~ nothing like a "terrace" on the lower hills towards Hirdwar or beyond it. I never read of the discovery of recent sea shells anywhere in these regions. There is nothing hereabouts to suggest the agency of "floating ice" in lake or sea, or of lake or sea to float anything in.

11. But as avalanches do fall into these Indian rivers, and make snow bridges, fragments of hard snow, or of glaciers, may possibly float down streams, and carry stones on ice rafts. Thus far I have seen no stones to suggest that possible method of transport by floating ice. The glaciers of which I have photographs are full of fallen stones, angular as they were when they broke from the cliffs. I have not seen one such stone in any river course that I have crossed. All the river stones are rolled.

12. From my recent observations I see no reason to assume any great difference in this climate since the Sivaliks were deposited; since many kinds of extinct elephants lived hereabouts, with large saurians, like those which live in plain rivers now. I have found nothing to indicate a glacial period in India. What I noticed in travelling round the world you will find in the "circular notes" quoted above of which copies were at Bombay and Simla when I passed.

13. *Kangra, 20th*.—I passed yesterday over ridges which have been called "moraines." My way led down stream to a fork, and then up stream to a level country. The gorge is manifestly cut by the river, and gives a section of beds of sandstone with a northerly dip. I noticed some large, rounded stones in the sandstone and some were "horse tooth" granite. Consequently the transport of such stones went on during the formation of these tilted beds. Near the top of the gorge I came to a thick bed of large rolled stones of many kinds. The bed seems to rest unconformably on the sandstones, on both sides of the river and to cover a considerable

area though generally hidden beneath the soil. At a place called "Cowlee" I found a great number of very large stones in and about a river, which is crossed by a bridge. They are far larger than any that I have found elsewhere. I measured one roughly  $12 \times 8 \times 8$  feet, and another 15 feet long. Many thousands of stones near this size have been washed out of the matrix which is hard roddish sandy stuff like the soil of the fields. As stones of this great size give reason to suspect glacial action, I sought carefully for marks. I went to the banks from which stones projected and found the surfaces where newly exposed, perfectly preserved. These were all smooth, or dented, water-worn surfaces. There was no sign of striation on any stone that I examined. After a long search I came to the conclusion that these great stones were rolled to their present resting-place, and that this is not a moraine, but a "Delta."

Near Kangra a view is got which shows that the region crossed, in which these unusually large stones occur so abundantly, is the estuary of a number of streams which come out of a rocky amphitheatre furrowed by steep V water-courses, which begin at the top of the ridge, at the snow. From each of the larger furrows, extends a ridge of stuff which has been taken for a moraine. I am quite certain that I crossed no moraines. An old "moraine" consists of angular stones carried upon the surface of a glacier; of stuff carried in the ice; and of stones pushed along beneath the ice. There are medial and lateral moraines; the terminal moraine forms at the end of a glacier and makes a crescent-shaped rampart crossing a valley. It often forms a lake, like a "bund." In these long ridges which I can see from this dāk bungalow, there is nothing like the shape of any kind of moraine. In crossing them I saw no large angular blocks; no small angular stuff; no striated stones, great or small. I can see minute details of the great hill face opposite to me, and there is no smoothed gorge there which could possibly have been the bed of a large glacier. From ridge to base the gorges are angular furrows, between ridges of extraordinary sharpness and steepness, in which the minutest details are picked out in snow, and in shadow. I can only see two small smooth patches on which small glaciers of the second or third order may have rested high up. I am quite certain that the "Kangra erratics" are large "pebbles" washed out of the "Cads," by heavy floods. Stones larger than any that I have yet seen, are nearer to the mountains but they are all rounded. I can hear of no angular blocks, and I have seen none. What water may do in moving stones, is matter of observation and calculation. When a reservoir burst some years ago in England, the water swept away mills and machinery houses, and everything that stood in the way of the flood. I know many cases of extraordinary effects produced by unusual causes of this kind. The force of water depends upon the volume and velocity. Here the velocity must be extreme

for the fall is very rapid. The nearer to the hills the greater is the velocity. The weight of a stone in water is less by the weight of water displaced. The rainfall at Dhurmsala is 102 inches yearly. From the position of this high ridge at the edge of the plains the rainfall must be exceptionally great. A warm rain falling on deep snow causes an exceptional flood. I know a case in which such a combination worked havoc in Scotland. I cannot measure the area of the basin which I see, but it is large. From its exceeding steepness the water which falls into it, must gather, and flow out of it suddenly and with extraordinary volume, velocity, and force. Water power here seems ample, to account for the moving of the unusually large blocks of stone, which have been called "erratics."

In Java is a volcanic cone 12000 feet high, named Pangerango. A cone is the worst form for collecting water. Nevertheless at the foot of this cone a stream has dug a gorge, out of which it has shot stones as large as any which I have ever seen. There is no question of glacial action in Java. A portion of an inverted hollow cone is good for collecting water power and here is a funnel nearly big enough to hold Pangerango inverted. My opinion is that the Kangra "moraines" are "Deltas" and the "erratics" pebbles of large size, proportioned to great water power. The largest are nearest to the parent rock.

14. I found some beds of rolled stones yesterday in a hard matrix, so old that the pebbles had decomposed. Granite crumbled to sand at a touch; quartzite and slates broke to angular fragments at a tap from a hammer. This bed forms part of one of these so called "moraines." I suspect that it will be found to form part of the "Sivaliks" undisturbed. The place is not far from Kangra, near a river, at a place where a cutting has been made for a road. If I am right in this the same conditions have endured here since the deposition of these coarse pebble beds, and there has been no "glacial period" here since then.

15. I am one of those who believe that rock basins, which hold or have held water, commonly are glacial marks. The absence of lakes from these regions is evidence against glacial action. It has been said that depression at the upper end of a river valley, or elevation at the lower end may account for lakes like those of the Italian Alps. Here, in the dip of the Sivaliks, is evidence of such a movement; but there are no lakes, and I have seen nothing like old lake bottoms any where in these mountains.

I am therefore confirmed in my opinion, that the Alpine lakes and Scandinavian fjords, and Scotch "lochs" are marks made by ancient glaciers of vast size, like those of Greenland. I have seen nothing that bears the smallest resemblance to any of these, the largest glacial marks that I know, here in the lower ranges of the Himalayas. What evidence there may be of the former extension of existing Himalayan glaciers, nearer to them, I

do not know from personal observation. But so far as I can learn from photographs, and from people who have travelled in these glacier regions, there is nothing near these glaciers to indicate any extension, that implies any great change in the local climate, any great elevation or a "glacial period," that affected the whole world.

Let me say in conclusion that this opinion founded on observation is contrary to my old opinion founded upon theory. I came prepared to find evidence of extensive glacial action here in Northern India about Lat.  $30^{\circ} 31'$ . I have found none.

### THE BIG STONES.

S. Bhagsu, November 24th, 1876.

16. MY DEAR SIR,—After looking over a paper from Kangra, in order to make sure of my ground I went to "Dhada" on the 22nd. It is otherwise named on the map, but that ~~is the~~ name now used here for a dāk bungalow eleven miles eastwards. I find that traditions regarding the big stones resemble traditions about like stones elsewhere. They are projectiles, about which mythical beings are concerned. One stone in particular is a "deota" fenced in with a square wall, painted, and adorned with flags and flowers. The large group in which it stands is said to be the site of a battle, between hill people and plain people, and these are their missiles. The holy stone was thrown down by Shiv, to a Rani who prayed to him. On that stone I found incised the "spectacle ornament" of Scotch antiquaries in a cartouche. It is on the west side. Some one has painted a pair of feet, to make this also a human figure and a deota. Something like the sun is painted red on the east side, and numerous devices on the south. Hanuman is on the north side of the next stone to the south. The people walk in procession sun-wise about this stone, and do puja to the pictures. I have seen nothing like this stone "deota" elsewhere. At Dhada is the mouth of a  $\nabla$  gorge where the fall is about 12,000 feet in four horizontal miles, according to the map. It is a holy spot much used as a place for burning the dead, whose ashes are cast into the stream. It comes from a snow patch high up which is full of large stones. Close to the bridge I found a section of the "Big stone formation" and got to the solid rock surface under it, newly exposed, in a gravel pit. The stuff is sorted in layers of varying coarseness, from fine angular sand to the big stones. The bed rock is *not* glaciated. The thickness of the deposit may be 80 to 90 feet. Manifestly this is the apex of a Delta  $\Delta$ , in the jaws of a  $\nabla$  ravine, which has direct communication

with a snow patch full of big stones about 10,000 feet higher, and four or five miles distant. I am quite certain that no glacier, big enough to carry these stones, passed over the bed rock, whose surface is well preserved; below the dāk bungalow at Dhada and under the stuff.

17. *Yesterday, 23rd.*—I crossed the big stone deposit close to the foot of the mountains, about four miles from the ridge, and 12,000 feet below the crest. I walked eleven miles carefully examining surfaces on stones of all sorts and sizes. I could not find one striated stone on the whole march. I found that granite pebbles as large as corn stacks abound, opposite to the longer and larger gorges which come from the snowy crest, and have the greatest fall. I found none of the ~~shape~~ shape between these longer gorges, in the jaws of ravines which begin on steeper hill tops. These being slaty, send down slates of sorts, and the ~~ground~~ ground is covered with flat stones. I conclude that the ground which slopes from these hills to Kangra, is covered by a compound delta, arranged by water flowing from the whole series of streams which I crossed in walking eleven miles yesterday. I was unable to find any trace of glacial action at ten to fifteen miles from the base, or at the very base of the hills in this district.

18. From here I have made a careful drawing of one of three or four high patches on which small glaciers may have rested. New snow makes them conspicuous from a distance. The rocks below them are smoother than elsewhere, and large stones rest on the rocks. These piles of stone have the look of terminal moraines in the snow. They end at about 14,000 feet above the sea-level, or 10,000 feet on this lower slope. I suppose that small glaciers once lay on these shelves, and that the climate has altered so as to destroy them. Far lower down I have seen hereabouts old snow resting in rock "gulches." In the Alps such places are "couloirs" and "chimneys." As a case to illustrate the effect of such conditions; I was hunting chamois many years ago in Switzerland, opposite to the Shreckhorn, and came to one of these steep narrow snow slopes. My guide told me to hurry over it. I was scarce landed on the rocks when a mass of big stones rolled and bounded past, with great and increasing velocity. Thin slaty stones had got on edge, and whirled past like flying wheels. They came from a small glacier like those of which I seem to see the beds on these Kangra hills; and they never stopped till they got to a large glacier, nine miles wide and twelve to fourteen miles long, which was some thousands of feet below us, in a valley.

That glacier was slowly carrying masses of fallen stones towards the Grimsel. Thence down to Interlaken all marks of enormous glaciation abound. A hot sun started the stone avalanche, by melting ice which supported the stones, on a small terminus moraine. This Kangra ridge is somewhat like the Shreckhorn at the top, and stone avalanches must

often roll down on hard snow packed in narrow gulches. I notice that many of the largest stones have something like the shape of mill stones, and rest on a flat side. I think it possible that men may have seen the arrival of some of them, and that tradition ascribes their speed to "Shiv." I ascribe it to gravitation.

19. In the Alps and in Scandinavia I have seen many snow avalanches fall from steep hills, like those which I see from this house. If many square miles of a hill face, were swept of snow by a slide, like the roof of a house in a thaw, the snow avalanche here would certainly block up a deep water-course, form a "bund," and accumulate water power. In this hot sunny region a snow dam could not last. I am told by natives that big lumps of hard snow are washed down my road of yesterday. Ice dams have formed and burst in the Alps within human memory, and the result in the transport of rubbish was enormous. Not long ago an earthquake and heavy rains sent down from Mount Ararat a mass of snow, ice, mud, and debris, which flowed for twelve miles along a valley of less slope than the Kangra slopes below me, and carried enormous blocks of stone as far as they have been carried here. The great ridge above me has much snow on it, and may have had small glaciers high up, though no large glaciers have left marks on the hills. Causes like those which I have here indicated fully account for this big stone formation. Some probably rolled down upon snow slopes, in gulches, and rolled on over the slopes of deltas. Others may have been rolled down on the margins of snow "bunds," and may have been washed down normal slopes of gravel and sand by abnormal floods. A thunderstorm, or an earthquake may have helped in a region where the rainfall is said to be 102 inches, and where it may have been as great as it is elsewhere. A combination of such causes at long intervals, accounts for groups of large stones which I find here and there. Being exceptionally large and numerous, these seem to require exceptional conditions.

In any case I am quite certain that there is nothing on the ground which I have crossed to indicate the former presence of large glaciers on the Kangra slopes; either at 12 to 15 miles from the base of the high ridge, or at the base of it, or in the jaws of ravines which come from the crest of it, at Dhada, and elsewhere on my road thence to Bhagsu.

20. One of my objects in coming to India was to see for myself whether I could discover any trace of the "Ice cap." Theoretically, during a glacial period, a crust of ice ten thousand feet thick came from the north pole, and went to the equator. If it did it came down the Himalayan slopes. I have now seen in India enough of jagged sierras, and of ravines of enormous depth and sharpness, of which many run from east to west, to convince me that no ice cap has crossed this region from north to south

about Lat  $31^{\circ} 2'$ . It is impossible that an ice cap can have passed from Thibet, since these gorges began to be eroded. Some are three miles deep, so they must be very old. Forms which exist in the Himalayas prove the ice cap to be impossible. There is absolutely nothing here on which to found a "Glacial period," which produced an "Ice cap." There is no evidence, even of any great extension of local glaciers here. All the change that I can trace is the possible existence here, of small glaciers perched high up, near the crest, where snow now rests. That change of climate may have been the result of something like the atmospheric conditions which make the Sind rainfall about a fiftieth part of the rainfall here; and make the rainfall elsewhere about six times as great.

I am greatly obliged to you for wishing me to come here. My object is attained and very pleasantly.

*Calcutta, February 14th, 1877.*—And I am present at the reading of this paper, I suppose that the author's right to the last word would have been mine. I have been to Darjiling, to the hill station; and I have now gained some knowledge of points in Cashmir and Bhutan fifteen meridian degrees apart. I have seen a considerable part of Ceylon, and the low country between Bombay and Lahore and along the Oudh and Rohilcund railway, opposite to Nepal. I have had the advantage of reading Hooker's journal, and Mr. Blanford's, within sight of their ground, and I have the benefit of Mr. Medlicott's criticism. I have also read papers by Major Godwin-Austen and Mr. Belt. I see no reason to alter my opinion about the Kangra "big stones." I have seen many as big, in water-courses near Kursiong and Darjiling, left by streams which made the furrows and quarried the stones. The usual water-power is not sufficient to roll these big stones, because the gathering ground above them is too small in area and too low. But given a landslip, sufficient to gather a head of water, and the furrow would be swept by a flood when the dam burst. Numerous landslips of enormous size are visible from Darjiling; but the rivers Rungeet and Teesta have swept their beds clear of all obstructions. At some places very large rolled stones are left in these water-courses. But there are no deposits in the Indian plains comparable to the glacial deposits near Turin, in the Italian plains.

The burden of proof rests upon those who hold to improbabilities, and require conditions different from those which exist. So far as my facts go, they prove that Himalayan glaciers have never extended far from the regions in which glaciers now exist. These hang about the edges of great river basins, below very high gathering grounds of large area, which condense the warm damp atmosphere of the plains, and of the Southern Ocean. I have found nothing in India to prove that these conditions have altered materially since the Himalayas grew to be mountains.

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II.—*Note on the preceding paper.*—By H. B. MEDLICOTT, Esq.,  
*Superintendent of the Geological Survey of India.*

(Received Jan. 15;—Read Jan. 17th, 1877.)

Mr. Campbell has kindly permitted me to add a few words to his communication, to bring out a small residuum of difference that remains between us upon the question of a former greater extension of ice action in the Himalayas. On the wider question of the Ice Cap, I would only say that I have not understood that speculation as dispensing with local centres of accumulation, and thus requiring the polar ice to have poured over the Himalayas. On the smaller question too, Mr. Campbell has taken up the comparatively easy task of confuting the most extreme opinion. Although there is no mention of names; it is plain that the paper just read is a refutation of Mr. Theobald's *Ancient Glaciers of the Kangra District*, with a copy of which Mr. Campbell has induced me to visit that region. I had thought indeed that I had myself said all that was called for in answer to Mr. Theobald, in pointing out that his so called moraines were only ridges of erosion out of a diluvial deposit that must once have filled the whole valley (Rec. Geol. Survey, Vol. IX, p. 56); Mr. Campbell has, however, saved us any further trouble on that score by rehearsing all the well-known signs and tokens that must be left by a heavy glacier, and finding them wanting. In doing so he entirely confirmed my own observations.

I was the first (fourteen years ago, Rec. Geol. Survey, Vol. III, p. 155) to bring to notice the big stones of the Kangra valley as probably due to ice. I would beg leave to quote the few words I gave to the subject:

"The most interesting of these deposits is that in which large erratic blocks occur so abundantly along the base of the Dhaoladhar. It first shows itself on the east, about Haurbaug, and is nowhere more strikingly seen than along the steep inner slopes of the duns east of Dhurmsala, where the huge blocks are thickly scattered over the surface. In viewing this deposit as the result of glacial action, I base my opinion chiefly upon the size of the blocks (I measured one twenty-five feet by eighteen, by ten) and upon some peculiarities of distribution. An eye more practised than mine in glacial phenomena might detect more direct evidence, but it certainly is not well-marked, and it is easy to account for the subsequent removal of all such traces of glacial action in such a position as this. The blocks occur at a present elevation so low as 3,000 feet above the sea-level, and they are found through fully a thousand feet in height. They are almost exclusively composed of the granitoid gneiss of the central mass of the Dhaoladhar, from which their area of distribution is separated by a

lofty ridge of schists, through deep gorges in which they have evidently been conveyed, a huge block being occasionally found perched on the sides of these gorges, some hundred feet above the present level of the stream; yet in such places I failed to observe any groovings or roundings of the rocky sides. The absence of evidence of this kind may, perhaps, be attributed to the rapidly disintegrating action of the heavy rains. I was many times puzzled to account for the positions in which these erratic blocks occur. They are frequently found on the slopes of the range out of the way of any of these main gorges, and even up the little receding valleys of streams, which only drain the outer hills, and down which the blocks could not have come. Must we superadd the agency of floating ice? The total absence of erratic blocks in other positions is often equally puzzling. The position of this glacial deposit more to the west, in the confined and elevated longitudinal valleys between Sihunta and Choari, impresses one more forcibly with the antiquity of its origin; it there lies in gaps and on ledges a full thousand feet over the deep drainage gullies close by."

Thus I adopted the opinion while declaring the absence of the usual scorings, and trusting to the facts of great size and peculiar distribution. The first step was an appeal against negative evidence, based upon the possible obliteration of superficial markings, by weathering and attrition, and upon the fact that although it is quite true that a *large glacier* must score its bed and the stones that lie thereon, transport by ice occurs largely without any such marks being made. We have recently had in India, and in this very connection of ice-action, a striking illustration of the unworthiness of such negative evidence. In 1856, Mr. W. T. Blanford declared his conviction that the Talchir boulder-bed was of glacial origin. Every year subsequently one or more of the officers of the Geological Survey were engaged upon these rocks in various parts of India, and looking out for evidence for or against this judgment, yet it was not till 1872 that Mr. Fedden had the fortune to find a most complete case of striated and polished Talchir boulders resting on a scored rock-surface. There are good specimens of these scratched boulders now in the Indian Museum. I have placed a small one on the table for inspection. In the case of the Kangra boulders, any possible glaciers in the Dhaoladhar must have been short, and have had a very rapid discharge; and consequently were of inconsiderable thickness, conditions which would reduce the scoring action to a minimum.

As to direct evidence, the matter of size of the blocks is of course conditional. On an appropriate slope masses of any dimensions may be moved with very little effort. If these Kangra big stones are, as Mr. Campbell contends, solely torrential deposits from the mountain gorges, we have only to work that simple condition so as to account for them wherever found. It is here that a slight discrepancy occurs between Mr.

Campbell's observations and mine. He describes having taken a walk of eleven miles, and found no big stones in some minor gorges draining only from the outer ridges. Relying on this single observation, and perhaps also upon the privilege he claims as a non-professional geologist, Mr. Campbell eliminates and ignores what I have from the first said to be the chief argument for glacial action, that large blocks of the gneiss from the central ridge do frequently occur away from the gorges leading from that ridge, in minor valleys draining only from the outer ridge, where it is most difficult to suppose they can have been placed in the manner he supposes. It was to account for the position of these blocks that I had to imagine their transport on ice-rafts. Instead, however, of insisting on this crucial point, which Mr. Campbell ignores or denies, I am prepared to suggest how it may be compatible with the view he adopts. The fact that coarse diluvial deposits, not derivable from the Sivaliks, are found high over Kangra fort, on the hills south of the valley, makes it certain that the whole valley was once filled with like deposits, which must have reached high along the base and far up the gorges of the Dhaoladhar. It may be that under such conditions the diluvial spill from the gorges was high enough to mantle round and over spurs and to fill little valleys that are now totally cut off from those gorges.

It would be impossible to estimate the plausibility of this supposition without testing it on the ground in view of actual features. At the same time I think that Mr. Campbell can only make out a Scotch verdict of 'not proven' for the ice, as deeply implicated in the transport of these big stones. I cannot bring myself to doubt the evidence that has been given for the former extension of the great Himalaya glaciers to 4,000 feet lower than they at present attain to, as observed by Dr. Hooker, and by Mr. W. T. Blanford in Sikkim. At that time ice-agency must have been very active on the Dhaoladhar. If at present, as Mr. Campbell testifies, lumps of ice are brought by the torrents to the mouth of the gorges, the lumps of those days were probably large enough to pick up the big stones in their way. I would further suggest for Mr. Campbell's consideration, that so far as we can at present estimate it, the age of these high-level gravels along the base of the Himalayas, and to which the Kangra deposits belong, seems to be closely coincident with that of the Ice-Age of the western continents. An increase of glacial conditions in the Alps, corresponding to that proved for the Himalayas in Sikkim, would probably bring the ice down to Interlaken, if not to Neufchatel.

I would conclude these few remarks with the hope that among the many settlers in the Kangra valley, there may be some members of this Society who will study the ground they live upon with some other purpose besides the cultivation of tea.

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III.—*List of the Mollusca brought back by Dr. J. ANDERSON from Yunnan and Upper Burma, with Descriptions of new Species.*—By G. NEVILL, C. M. Z. S.

The following is a list of the mollusca collected by Dr. Anderson on the two Yunnan Expeditions of 1868 and 1874, with descriptions of the new species and varieties; the greater part of the more remarkable novelties from the First Expedition have been already described by Mr. W. T. Blanford, in the P. Z. S. for 1869.

I prepared this list for Dr. Anderson's work on the zoology of Yunnan and Upper Burma about a year ago; since then several of my identifications have been noted by other writers. M. Morelet especially, in a most excellent account of the mollusca of "Indo-Chine," published as the 4th Livr. of the Ser. Conchil. in April 1875, with figures of the new and more important species, entirely confirms my views as to the probable identity of our common *Paludina Bengalensis* with species described from Sumatra, Siam, &c., as detailed further on; he records the occurrence in "Indo-Chine" of our Indian or Burmese *Helix capitum*, *Pythia plicata*, *Planorbis exustus*, *P. compressus* (which he identifies with *P. Tondanensis* from Java and *P. saigonensis*), *Cyclophorus fulguratus*, *C. Bensoni* (this identification I very much doubt), *Ampullaria globosa* and *A. conica*, *Paludina Bengalensis* with its variety *polygramma*, *P. ampulliformis* (= *P. lecythis* Bens., in my opinion doubtfully distinct from Gray's *P. Ohinensis*), *P. præmorsa*, *Bithinia goniomphalus* (= *B. iravadica*), *Stenothyra monilifera*, *Melania Touranensis* (which he, no doubt correctly, believes to be only a variety of our *M. variabilis*), and *M. spinulosa*. He also anticipates in publication my views of the correct determination of the very difficult group of *Neritina* (*Dostia*) *violacea*: he unites into two species the three forms described and figured in this Journal for 1868 from Burma by Mr. W. T. Blanford, viz., *N. violacea*, Gm. (= *crepidularia*, Lam.) with *N. drepressa*, Bens., as a variety, and *N. cornucopia*, Bens., which he considers as specifically quite distinct, in which I decidedly agree with him, though we are both in opposition in this matter to the greatest living authority on the genus, Dr. E. von Martens, who, in his recent monograph of *Neritina*, for Küster's Ed. Conch. Cabinet, unites all three forms into one.

The late Prof. Deshayes in Vol. X of the *Nouv. Archives du Muséum* (1876) gives a list of mollusca, collected lately in Cambodia by Dr. Jullien, in which many interesting forms, allied to our Indian genera, are fully described and figured; unfortunately, unlike M. Morelet, he entirely ignores the neighbouring Indian and Burmese regions and seeks for allied forms in South America. As well as I can judge without actual inspection

of his types, he describes varieties of our *Paludina Bengalensis* as *P. Chalangnensis* and *P. speciosa*, a variety of our *Melania variabilis* as *M. Jullieni*; his *Unio anceps* is wonderfully close to some upper Burmese varieties of *U. Bonneaudi* and should be compared with it; his *U. comptus* and *U. Crossei* also require comparison with Burmese forms; the former I fear may prove identical with my *Unio fragilis*; his *Paludina obscurata* is also found in Penang, and I believe it has been previously described.

A more accurate and ample report on the mollusca of the same region is published in the *Journal de Conchil.* for October 1876 by MM. Crosse and Fischer, in which the peculiar thick-shelled group of *Paludina Siamensis* is compared to that of the American sub-genus *Melantho*; I would call attention to the presence of a remarkable Bengal form of the same group, the *Paludina crassa* of Hutton, which has the singular habit of burying itself in closely packed groups of numerous individuals in the mud at all seasons, as accurately recorded in Hutton's excellent original description; our Cachar *Solenaia soleniformis*, Bens., so closely resembling South American species of *Mycetopus*, is also perhaps worthy of special remark in connection with MM. Crosse and Fischer's comparison of the *Unionidæ* of "Indo-Chine" with those of South America; I would also record here that a species of *Canidia* was lately discovered in the Rangoon river by Dr. Hungerford; it is the *C. Bocourti* of Brot (l. c., Pl. XII, fig. 6). M. Brot seems to have most thoroughly and undeniably fixed the proper systematic position of this interesting genus in the family *Buccinidæ*, instead of the *Melaniidæ*, where it had hitherto been classed.

I have given figures in the 'Report on the Zoology of Yunnan,' which Dr. Anderson is about to publish, of the following species described in this paper,—*Helicarion resplendens*, *Trochomorpha percompressa*, *Glessula fusiformis*, *Bithynia turrita*, *Margarya melanoides*, *Paludina heliciformis*, var., *Paludomus Burmanica*, *Unio fragilis*, *U. Andersoniana*, *U. Feddeni*, and two varieties of *U. Bonneaudi*.

#### TROCHOMORPHA PERCOMPRESSA, Blf.

*Helix (Sivella) percompressa*, Blf. P. Z. S. 1869, p. 448.

The single type specimen in the Museum collection, found on the First Expedition at Bhamô, remains unique.

#### NANINA (ROTULA) ARATA, Blf.

*Nanina (Rotula) arata*, Blf., P. Z. S. 1869, p. 448 (Bhamô).

*Helix arata*, Blf., Con. Indica, pl. 82, figs. 8—9.

Very closely allied to *N. anceps*, Gld., but may, I think, be fairly separated; the spire is considerably higher, and the base of the body-whorl more excavated round the umbilicus; the keel at the periphery is less acute

and the epidermis appears to be darker; the sculpture is precisely similar; the Museum possesses specimens of *N. anceps* from Tenasserim, also from Moulmein. Dr. Anderson found *N. arata* tolerably abundant at Bhamô and Pongee; the specimens from the latter locality are rather smaller and are the var. *minor* of Blanford.

NANINA (MACROCHLAMYS) RESPLENDENS, Phil.

*Helix resplendens*, Phil., Zeits. Mal. 1846 (Mergui).

This species was found abundantly at Bhamô and in the second defile of the Irawady. The specimens are quite undistinguishable from others in the Museum from Mergui (typical locality). I think it doubtful if Godwin-Austen's *N. atricolor* from the Shisha Valley will prove really distinct.

The figure in the Con. Indica, pl. 5, fig. 4, is not characteristic of the species; it appears rather to represent *N. vitrinoides*.

NANINA (MACROCHLAMYS) HYPOLEUCA, Blf.

*Nanina (Macrochlamys) hypoleuca*, Blf., J. A. S. B. 1865 (Akoutong).

*Helix hypoleuca*, Blf., Con. Indica, pl. 64, figs. 6, 7.

A single specimen of this well-marked species was found at Bhamô; there are also specimens in the Museum from Pegu, Arakan, and Mergui.

NANINA (DURGELLA) HONESTA, Gld., var. ANDERSONIANA.

*Helix honesta*, Gld., Pr. Bost. Soc. 1844 (Tavoy).

*Nanina honesta*, Gld. var., Stoliczka, J. A. S. B. 1871, pl. 17, figs. 7-9.

This species a good deal resembles an Assam form; its thicker and more shining substance, less open perforation, less oblique peristome (which is considerably more broadly reflected, nearly covering the perforation), and its possessing a whorl less well, however, distinguish it. Typical *N. honesta*, as admirably figured in the Con. Indica, pl. 90, fig. 10, is found at Pegu, Moulmein, and Thyet-Myo; var. *andersoniana* at Thyet-Myo, Sibsaagar, Naga and Khasi Hills, Chittagong, and East Cachar; Dr. Anderson also found it at Pongee, Ava, Nanting, and 2nd Defile (Irawady). This variety is distinguished by its less depressed shape, it is scarcely if at all angled at the periphery (the angulation being very distinct in type form), the peristome not quite so broadly reflected over the perforation; the substance and texture, perforation, shape of the aperture, and number of whorls are identical.

Type of var. *andersoniana*, from Pongee: axis  $6\frac{1}{2}$ , diam. 11 (apert. alt. 4, diam.  $5\frac{1}{2}$  mil.).

Specimen from Chittagong: axis 7, diam. 13 (apert. alt. 6, diam.  $6\frac{1}{2}$  mil.).

Specimen from Khasi Hills: axis 7, diam. 15 mil.

Typical *N. honesta*, from Pegu: axis 6, diam. 12 (apert. alt.  $5\frac{1}{2}$ , diam.  $6\frac{1}{2}$  mil.).

## NANINA (SITALA) ATTEGLIA, Bens.

*Helix atteglia*, Bens., A. & M. 1859 (Phio Than); Con. Indica, pl. 86, fig. 7.

This species was found at Prome and Bhamô; the museum also possesses specimens from Moulmein, Assam, and Prepara Island.

## NANINA DIPLONDON, Bens.

*Helix diplodon*, Bens., A. & M. 1859, p. 187 (Teria Ghat); Con. Indica, pl. 60, fig. 8.

A few specimens were found at the 2nd Defile below Bhamô and also at Ponsce in Yunnan. The outer tooth of the aperture varies slightly in shape. This species seems to be allied to the *Sesara* group.

## NANINA (ROTULA) PANSA, Bens.

*Helix pansa*, Bens., A. & M. 1856, p. 252 (Akoutong); Con. Indica, pl. 56, fig. 1.

Found at Prome and also at Kalawat.

## NANINA (MICROCYSTIS) BARAKPORENSIS, Pfr.

*Helix Barakporensis*, Pfr., P. Z. S. 1852, p. 156 (Titalya, &c.); Con. Indica, pl. 87, fig. 7.

*Nanina (Kaliella) Barakporensis*, (Pfr.) Blf., J. A. S. B.

A single specimen only was found at Bhamô. The differences between the sub-genera *Kaliella* and *Microcystis* appear to be not yet sufficiently characterized.

## HELIX (PLECTOPYLIS) ANDERSONI, Blf.

*Helix (Plectopylis) Andersoni*, Blf., P. Z. S. 1869, p. 448; Con. Indica, pl. 112, fig. 8; Godwin-Austen, P. Z. S. 1874, p. 612, pl. 74, fig. 9.

This remarkable form was not obtained on the Second Expedition; it was originally found at Hoctone and Bhamô.

## HELIX (PLECTOTROPIS) TAPEINA, Bens.

*Helix tapeina*, Bens., J. A. S. B. 1836, p. 352, (Sylhet).

The type specimens of Benson's *H. tapeina* are in the Indian Museum. Plate 15, fig. 6 of the Con. Indica well represents the form. It is distinguished from all other allied species by the less oblique columellar margin, rounded and not angular at the base (as are all its varieties); the keel at the periphery is acute. Typical *H. tapeina* is found abundantly at Cherra Punjee and in Assam.

## var. AKOUTONGENSIS, Theob.

*Helix akoutongensis*, Theob., J. A. S. B. 1859, p. 306; (not Con. Indica, pl. 15, fig. 4)

Only differs from the preceding by its more oblique columellar margin, more acutely keeled periphery, slightly more open umbilicus, and more depressed spire. I look upon this form as doubtfully separable from the next: the differences may be merely perhaps incidental to individuals, and not even to local races.

Dr. Anderson found this variety in Upper Burma, where it was very common. There are also specimens in the Museum from Ava and Thyet-Myo.

Axis 5, diam. 15 mil.

var. ROTATORIA, Busch.

*Helix rotatoria*, v. d. Busch., Phil. Abb. 1842 (Java); Mouss., Moll. Java, pl. 2, fig. 8.

Only distinguished from the preceding variety by the less distinct or less excavated sutures, by the very acutely keeled periphery, and by the very white, more thickened, and less rounded margins of the aperture, showing within a distinct emargination at the periphery. Plate 15, fig. 5 of the Con. Indica is an excellent representation of this form; it only differs from the figures of Mousson and Philippi by its slightly more raised spire.

There are specimens in the Museum from Promé, Akoutong, Assam, and Khasi Hills; it was also found by Dr. Anderson at Manwyne and Shan Hills.

Specimen from Akoutong, axis 6, diam. 15½ mil.

var. BHAMOENSIS, nov.

Distinguished from typical *H. tapeina* by the last whorl, which is only slightly angular and not distinctly keeled; the aperture is smaller and less produced, with the columellar margin slightly oblique and angular at base; it is smoother and less depressed than var. *rotatoria*, with squarer aperture and without the acute keel at the periphery. The raised spire and angulate (not keeled) periphery agree with those of *H. phayrei*; it is, however, smoother, less openly umbilicated, with more contracted aperture and less developed sculpture than that species.

This variety connects *H. tapeina* almost insensibly with *H. catostoma*, Blf., and its varieties; the more raised spire, less open umbilicus, and more rounded and regular margins of the aperture, without any sign of being thickened or subdentiform at their base, are the best distinguishing characteristics.

Four typical specimens of this variety were found at Bhamô. Major Godwin-Austen has also presented some similar specimens from the Naga Hills. Plate 15, fig. 10 of the Con. Indica looks to me as much like this variety as it does the shell it is said to represent (that is, *H. Arakanensis*, Theob., J. A. S. B. 1864, p. 5), from which, however, it is easily distinguished by its more open umbilicus, less conically raised spire, and by the absence of the acute keel at the periphery, &c.

Type from Bhamô, axis 6½, diam. 12½ mil.

### HELIX (PLECTOTROPIS) TRICHOTROPIS, Pfr.

*Helix trichotropis*, Pfr., Zeits. Mal. 1850 (China); Conch.-Cab., pl. 134, fig. 9-10.

This species differs from *H. tapeina* by the shape being a trifle more trochoid, the apex more central, and the whorls more concave; the keel at the periphery is even more developed, and the aperture a trifle more produced laterally; a marked characteristic is the minute and close spiral sculpture of the base, which in *H. tapeina* and all its varieties is on the other hand distinctly though minutely granulose; it is principally on account of this last character that I prefer to class *H. trichotropis* as a distinct species, and not as a variety of *H. tapeina* (near *rotatoria* and *akoutongensis*.)

Major Godwin-Austen found an extremely interesting form in the Khasi Hills, with more depressed spire and thinner texture (axis 6, diam. 18 mil.); it is, I believe, one of these specimens that is represented in the Con. Indica (pl. 15, fig. 4) as *H. akoutongensis*, from Pegu. A few specimens were found by Dr. Anderson at the Second Defile, Irawady; they agree exactly with specimens in the Museum from Shanghai.

Specimen from 2nd Defile, Irawady, axis 6, diam.  $15\frac{1}{2}$  mil.

### HELIX (PLECTOTROPIS) PERPLANATA, n. sp.

(*H. trichotropis*, var. ?)

Four specimens only of this very remarkable form were found at Mimboo, Upper Burma; a larger series is required to prove with certainty whether it be a distinct form, or only a variety of *H. trichotropis*, or of *H. tapeina* (near var. *rotatoria*).

After a most careful examination with a lens, I am unable to trace any sculpture whatever on the base; the seven whorls above are perfectly flat, as in the European *H. explanata*; the keel on the periphery and the shape of the aperture are about the same as in *H. trichotropis* (especially the Khasi form); the umbilicus, however, is considerably more open, quite twice as open as in the Chinese and the above recorded specimens, and about half as open again as in those from the Khasi Hills; the epidermis seems peculiar, having the appearance of being less close in texture and of a decidedly more developed character.

Axis  $4\frac{1}{2}$ , diam.  $17\frac{1}{2}$  mil.

### HELIX (PLECTOTROPIS) OLDHAMI, Bens.

*Helix Oldhami*, Bens.—A. & M. 1859, ser. 3, vol. III, p. 184; Con. Indica, pl. 15, fig. 7.

This species, well represented in the Con. Indica, is next allied to *H. catostoma* and to *H. tapeina*; the characters of the aperture distinguish it

from the former, the very open umbilicus &c., from the latter. A single specimen was found at Ava, agreeing exactly with typical specimens from the Arakan Hills.

#### HELIX (PLECTOTROPIS) CATOSTOMA, Blf.

*Helix (Trachia) catostoma*, Blf., P. Z. S. 1869, p. 447 (Ponsee).

*H. catostoma*, Blf., Con. Indica, pl. 56, figs. 2, 3.

The specimen figured in the Con. Indica is not taken from a typical Yunnan specimen, but probably from one from Assam. The type in the Indian Museum, found at Ponsee on the First Expedition, is the only adult specimen as yet found in Yunnan; though, indeed, nine or ten immature specimens were also found, in none of which, however, are the characters of the lip developed. *H. catostoma* was found by Major Godwin-Austen and Mr. Robert tolerably abundantly in the Naga Hills, and it is probably one of these specimens that is figured as above in the Con. Indica; they only differ from the type form by the less depressed spire and slightly less open umbilicus; the characters of the aperture are the same, the dentiform process on the basal margin being equally developed and characteristic in both.

#### HELIX (PLECTOTROPIS) HUTTONI, Pfr., var. SAVADIENSIS NOV.

*Helix Huttoni*, Pfr., Symb. II. (Landour, &c.)

The shell represented in the Con. Indica, pl. 15, fig. 8, is not, I think, a typical specimen from the North-West Himalayas, but rather a specimen from Darjiling; the former is a smaller, more rounded, and less solid shell, scarcely keeled at the periphery, with a higher spire and less produced aperture. A form found by Dr. Anderson abundantly at Ponsee and Ava is nearer the Darjiling form; the spire is slightly higher, with the apex more central. Seven specimens of a distinct and remarkable variety were also found at Sawady; at first sight these present a curious resemblance to *H. arakanensis*, and with that species are probably the connecting link between *H. tapeina* and *H. huttoni*, though unmistakably only a variety of the latter; var. *savadiensis* differs by its more raised spire, stouter texture and less open umbilicus. *H. winteriana*, v. d. Busch. (Java) seems to be a var. of *H. huttoni*, differing by its more open umbilicus.

Specimen from Darjiling, axis  $5\frac{1}{2}$ , diam.  $12\frac{1}{2}$  mil.

Var. *savadiensis*, from Sawady, axis 7, diam.  $12\frac{1}{2}$  mil.

#### HELIX (PLECTOTROPIS) PHAYREI, Theob.

*Helix Phayrei*, Theob., J. A. S. B., 1859 (Ava); Con. Indica, pl. 1, fig. 15.

This is the largest species of the group, and is well figured in the Con. Indica; it appears to be rare, as three specimens from Ava are all there are in the Museum. It is next allied to typical *H. tapeina*, the umbilicus being exactly similar; the periphery, however, is merely angulate, not keeled;

the sculpture above is considerably coarser and more developed, the columellar margin more oblique and slightly angulate at base, and the outer margin more produced and rounded.

### HELIX (TRACHIA) DELIBRATA, Bens.

*Helix delibrata*, Bens., J. A. S. B., 1836 (Sylhet).

*Helix procumbens*, Gld., Proc. Bost. Soc. 1844 (Tavoy).

The types of this species from Sylhet are in the Indian Museum. It is a form with an unusually open umbilicus, a single spiral brown band, and a rather flat spire. Major Godwin-Austen has also presented similar specimens from the Khasi Hills. A closely allied form is abundant in Arakan and Bassein; this only differs by the umbilicus being a trifle less open; it is well represented in the Con. Indica, pl. 14, fig. 10. Close to both the preceding are six specimens found by Dr. Anderson at Bhamò, umbilicus like that of the type form, suture a shade more excavated, slightly smaller in size. Var. *fasciata*, Godwin-Austen, J. A. S. B. 1875, pl. 1, fig. 1, is abundant at Seebsaugor in Assam; it only differs by its colouration. For the shell figured in the Con. Indica, pl. 14, fig. 9, I suggest the name of var. *khasiensis*; the raised and rounded whorls, less open umbilicus, and contracted aperture well distinguish the form; it has sometimes a single brown band, but is oftener without it; it is tolerably abundant in the Naga and Khasi Hills.

Type of *H. delibrata*, from Sylhet, axis  $7\frac{1}{2}$ , diam. 21 (apert. alt. 9, diam. 11 mil.).

Specimen from Bhamò, axis  $6\frac{1}{2}$ , diam. 19 mil.

Var. *khasiensis*, from Khasi Hills, axis  $8\frac{1}{2}$ , diam.  $19\frac{1}{2}$  (apert. alt. 9, diam.  $10\frac{1}{2}$  mil.).

Var. *fasciata*, G.-A., from Seebsaugor, axis 9, diam.  $23\frac{1}{2}$  mil.

### HELIX (GANESELLA) CAPITUM, Bens.

*Helix capitum*, Bens., A. & M. 1848, ser. 2, vol. ii, p. 160 (Behar);

*H. hariola*, Bens., A. & M., 1856, ser. 2, vol. xviii, p. 251 (Thayet Myo).

There is no specimen in the Museum from Bengal of either of the shells called *H. capitum* or *H. hariola*, but I am informed by Mr. W. T. Blanford that he has in his collection specimens of typical *H. capitum*, from the Ganges Valley and from the Nullaymullay Hills in Southern India, and that he is convinced that the form in Upper Burma, first found by himself in 1861, cannot be distinguished. Morelet, Ser. Conch. IV, p. 254, 1875, records a most interesting locality for *H. capitum*, viz., Bangkok in Siam. On the other hand the Museum possesses both forms from Burma, from Prome the form figured in the Con. Indica, pl. 14, fig. 6, as *H. hariola*, and from Ava that figured on the same plate, fig. 5, as *H. capitum*; the latter Dr. Anderson also found at Kalawat in Upper Burma; the two forms

seem to me perfectly identical, except that var. *hariola* is keeled at the periphery.

**HELIX (DORCASIA) SIMILARIS, Fér.**

*Helix similis*, Fér. Prodr., 1821.

Found abundantly at Prome, Pagan, Bhamò, and Sanda, with and without the brown band at the periphery; specimens agree exactly with others in the Museum from Penang, Shanghai, and Thyet-Myo; specimens from Mauritius, Bourbon, Seychelles, and Brazil differ slightly, but most certainly belong to one and the same species.

Axis max.  $9\frac{1}{2}$ , diam. max.  $16\frac{1}{2}$  (apert. alt.  $8\frac{1}{2}$ , diam.  $8\frac{1}{2}$  mil.).

**HELIX (DORCASIA) BOLUS, Bens.**

*Helix bolus*, Bens., A. & M., 1856 (Prome).

*tourannensis*, Soul, Voy. Bonite., Pl. 29, fig. 1-2 (Cochin China);

Con. Indica, pl. 23, fig. 7.

Dr. Anderson found this species very abundant at Pagan, Upper Burma, and at Pensee and Sanda in Yunnan; typical specimens from Prome are exactly similar; specimens of var. *tourannensis*, from Cochin China, only differ by the spire being slightly more raised.

**HELIX (DORCASIA) ZOROASTER, Theob.**

*Helix zoroaster*, Theob., J. A. S. B. 1856 (near Ava); Con. Indica, pl. 86, figs. 2, 3,

This species can be constantly distinguished from *H. similis* by its larger and more depressed form, by the considerably more open umbilicus, the more angulate last whorl, and the more produced aperture; the columellar margin of which is much more oblique. It was found abundantly at Prome, Thyet-Myo, Pagan, Tsagain, and Manwyne.

Axis max.  $9\frac{1}{2}$ , diam. max.  $18\frac{1}{2}$  mil. (apert. alt. 9, diam. 10.)

**HELIX (DORCASIA) SCALPTURITA, Bens.**

*Helix sculpturita*, Bens., A. & M., 1859 (Ava); Con. Indica, pl. 53, fig. 9.

This fine species was found abundantly at Tsagain, Ava, Mandalay, and Second Dese, Irawady; it can be distinguished from both the preceding species by the rounded whorls and raised spire and by the height of the aperture; the brown band is almost always very distinct and richly coloured, in one or two specimens only is it obsolete. Though undoubtedly this and the two preceding forms are most closely connected, I consider all three at present as well-established species.

Axis max. 13, diam. max.  $21\frac{1}{2}$  mil. (apert. alt. 11, diam.  $11\frac{1}{2}$ ).

**PUPA (CYLINDERUS) INSULARIS, Ehr.**

*Pupa insularis*, Ehr., Symb. Phy. (Red Sea); *P. pulla*, Gray, P. Z. S. (Banks of the Ganges). *P. cylindrica*, Hut., J. A. S. B. 1834; *Bulimus insularis*, Ehr., Con. Indica, Pl. 22, fig. 10.

This, probably our commonest Indian land-shell, was found in great abundance at Pagan, Upper Burma; very curiously neither this nor the next species are found at all in the neighbourhood of Calcutta. The Museum possesses specimens from Aden, Gwadar, Abyssinia, Sind, Kutch, Salim Range, Trichinopoly, Ceylon, Poona, Burwani Hills, Tinali (Benares), and Saharunpur (N. W. Provinces). The Burmese localities of *P. insularis* and *P. cœnopictus* now recorded, I consider particularly important and interesting. Pl. 22, fig. 10 of the Con. Indica well represents the Burmese form.

**PUPA (LEUCOCHILA) CÆNOPICTUS, Hutt.**

*Pupa cœnopictus*, Hutt., J. A. S. B. 1834 (Agra).

*Bulimus cœnopictus*, Hutt., Con. Indica, pl. 23, fig. 9.

Found abundantly at Ava and Tsagain, Upper Burma; there are also specimens in the Museum from Erode, Cutch, Patna, Trichinopoly, Delhi, Quetta, Abyssinia, and Gwadar.

**PUPA (SCOPELOPHILA) SALWINIANA, Theob.**

*Pupa salwiniana*, Theob., J. A. S. B. 1870 (Shan States); Con. Indica, pl. 100, fig. 9.

I found a single specimen of this interesting shell inside a *Glossula obtusa* from Bhamò.

**SUCCINEA ACUMINATA, Blf.**

*Succinea acuminata*, Blf., P. Z. S., 1869, p. 449 (Ponsee); Con. Indica, pl. 68, fig. 7.

Found on the First Expedition only, at Momein in Yunnan; it is a well characterized and perfectly distinct species.

**VERONICELLA, n. sp.**

Two very fine specimens of an apparently quite new form were brought back from Ponsee, preserved in spirit; even in their present contracted state the bigger one is 93 mils. in length; I prefer not giving them a name at present, as I am not prepared to describe their anatomical characters.

**VERONICELLA BIRMANICA, Theob.**

*Vaginulus Birmanica*, Theob., J. A. S. B., 1864, p. 243 (Rangoon, &c.)

This species is not mentioned by M. Fischer, in his Monogr. of the genus, Nouv. Archiv. Vol. VII. Stoliczka gives further details concerning the form, J. A. S. B., 1871, p. 33. Dr. Anderson brought back eight specimens from Bhamò and Tonsine, preserved in spirit, of course; the largest measures 24 mils.

**HELICARION RESPLENDENS, n. sp.**

Shell in texture and colour resembling *Helic gigas*, Bens., but a little thinner and more membranaceous; it is at once distinguished from it

by its flattened, more ear-like and appressed shape. It also somewhat resembles *Helic. Peguensis*, Theob., J. A. S. B. 1834, p. 8, from Prome; it is, however, a larger and thicker shell, with the whorls of the spire much broader and more distinct, and considerably less open at the base; in many respects it is intermediate between the above two species, though all three are easily recognisable and quite distinct.

Type of *Helic. resplendens*, diam. max. 22, lat. 14, crass. 8 mil.

*Helic. gigas*, (small specimen), diam. 22, lat. 16, crass. 10 mil.

*Helic. Peguensis*, diam. 17, lat. 10, crass. 5 mil. (a rather larger specimen than the type).

Four specimens of this interesting form were found at Sawady. Dr. Anderson also brought back a single specimen (in spirit) from Bhamò (5000 ft.) which clearly shows the animal to be of a light pinkish colour, very sparsely dotted with black specks, except on the mantle lobes and caudal extremity, which are thickly dotted; in this specimen the spire of the shell only is covered by the animal, though the mantle lobe has no doubt shrunk.

#### HELICARION GIGAS, Bens., var.

*Vitrina gigas*, Bens., J. A. S. B., 1836, p. 350 (Sylhet).

A single specimen was found at Kyoukphoo; though differing slightly, it is so close to the shell of typical *Helic. gigas*, that I think there can be little doubt of their identity.

Diam.  $35\frac{1}{2}$ , axis  $8\frac{1}{2}$ ; apert. lat.  $27\frac{1}{2}$ , alt. 21 mil.

#### HELICARION MAGNIFICUS, n. sp., G. A. and NEV.,

I am indebted to Major Godwin-Austen for pointing out that this magnificent slug, the largest yet known of the genus, is quite distinct from Benson's *Helic. gigas* (Khasi Hills); Godwin-Austen has kindly undertaken to describe the animal with full details and a figure, so that it is only necessary for me here to state that it is very closely allied to the Assam species, but that the shell is much larger, of a brown (not green) colour, with the body-whorl much more flatly expanded, and the spire less convoluted and more depressed, and that, looked at from underneath, very much less of the reflected body-whorl is visible.

The largest specimen, in spirit, measures 70 mils.

Shell, diam. maj. 46, axis,  $11\frac{1}{2}$ ; apert. lat.  $40\frac{1}{2}$ , alt.  $29\frac{1}{2}$  mil.

Tolerably abundant at Momein in Yunnan, at 5,500 ft.

#### HELICARION VENUSTUM, Theob.

*Vitrina (?) venustum*, Theob., J. A. S. B. 1870, p. 400 (Arakan).

? *Helic. solidum*, G. A., P. Z. S., 1873 (Hengdan).

Dr. Anderson brought back, from Ponsee in Yunnan, numerous specimens (preserved in spirit) of a small form, the shell of which I am unable

to distinguish from typical Arakan specimens of *Helic. venustum*, only differing in apparently being of a smoother and more polished texture and in the spire being a shade more distinctly convoluted; a single specimen of *Helic. solidum* from the Naga Hills is quite undistinguishable from the above Arakan specimens. The figures in the Con. Indica of the two forms are however so distinct that the types will have to be re-examined. Dr. Anderson also brought back a small specimen (in spirit) of apparently the same form from Nampura in the Kakhyen Hills, found under stones near running water; the animal of this specimen differs from that of my *Helic. resplendens* in apparently completely covering the shell and in being of a duskier, more uniform colouration, apparently not speckled at all, but of a darker tinge on the mantle lobes and caudal extremity than on the rest of the foot; this as far as it goes would seem to agree fairly with the original description of the animal of *Helic. solidum*, J. A. S. B. 1875.

#### HELICARION (CRYPTOSOMA) PRÆSTANS, Gld.

*Vitrina præstans*, Gld., P. Bost. Soc. 1843, p. 100 (Tavoy); Con. Indica, pl. 65, figs. 5, 6.

The entire shell is covered with a thick and compact brown epidermis; the largest specimen in the Museum, from Tenasserim, measures, axis  $27\frac{1}{2}$  diam.  $31\frac{1}{2}$  mil. It is an extremely abundant species in Tenasserim, and also near Moulmein; Dr. Anderson found it abundant at Sawady and on the banks of the Irawady, Second Defile.

#### ENNEA (HUTTONELLA) BICOLOR, Hutt.

*Pupa bicolor*, Hutt., J. A. S. B., 1834 (Mirzapore); Con. Indica, pl. 100, figs. 4—6.

Fairly abundant at Bhamô. Both *E. mellita*, Gld., and *E. ceylonica*, Pfr., are undoubtedly merely varieties of this most widely dispersed shell.

#### STREPTAXIS THEOBALDI, Bens.

*Streptaxis Theobaldi*, Bens., A. & M. 1859 (Teria Ghat); Con. Indica, pl. 8, fig. 8.

A few specimens were found at Bhamô, agreeing exactly with the typical Khasi-hill form.

#### STENOGYRA (OPEAS) GRACILIS, Hutt.

*Bulimus gracilis*, Hut., J. A. S. B. 1833 (Mirzapore); Con. Indica, pl. 23, fig. 4.

Found abundantly at Tsagain and Bhamô on the First Expedition.

#### GLESSULA OBTUSA, Blf.

*Achatina (Glessula) obtusa*, Blf. P. Z. S. 1869 (Bhamô); Con. Indica, pl. 36, fig. 6.

This fine shell was found only on the First Expedition at Bhamô.

## GLESSULA SUBFUSIFORMIS, Blf.

*Achatina (Glessula) subfusiformis*, Blf., P. Z. S. 1869, p. 449 (Ponsee).

The single type specimen in the Museum, found on the First Expedition at Ponsee in Yunnan, remains unique; the species cannot be confused with any other of our Indian forms.

## GLESSULA PYRAMIS, Bens.

*Achatina pyramis*, Bens., A. and M. 1860, ser. 3, fol. V, p. 463 (Teria Ghat); Con. Indica, pl. 18, fig. 6.

Several specimens were found at Ponsee in Yunnan which agree fairly with the typical Khasi form.

## GLESSULA BLANFORDIANA, n. sp.

Shell resembling that of *G. Peguensis*, Blf., but rather more slender and of thicker texture, easily distinguished by the acutely raised undulating, perpendicular, and longitudinal striation.

Long.           , diam.       mil.

Two specimens only from Ponsee in Yunnan.

## LIMNÆA ANDERSONIANA, n. sp.

Shell small, horny brown, imperforate, globose, spire short; whorls four to five, last whorl large, ovate; columella remarkably thick and reflected, straight, without any twist; aperture subovate, anteriorly rather wide.

This small species, well characterized by its remarkable columella, is unlike any Indian species; the figure that it most resembles in 'Küster's Monog.' is a var. of *L. peregra*, pl. 3, figs. 17, 18; there is no shell like it figured in the 'Conch. Iconica'; probably *L. andersoniana* will prove to be a common species throughout S. China.

The late Dr. Stoliczka has since collected a perfectly identical form at Yarkand, as well as a variety at Kashgar, the latter interesting as possessing a very small umbilicus; *L. andersoniana* appears to be next allied to *L. pervia*, Mart. (? = *L. Davidi*, Desh.) and will require further comparison with type specimens of the two latter.

Long. 10, diam.  $6\frac{1}{2}$ ; apert. long.  $7\frac{1}{2}$ , diam.  $3\frac{1}{2}$  mil.

Abundant at Sanda and Nantin in Yunnan, at 4000 feet.

## LIMNÆA YUNNANENSIS, n. sp.

Shell medium-sized, ovately oblong, imperforate, pale horn-colour, very fragile, spire acuminate; whorls three to four, last whorl remarkably small; columella very strongly twisted and much produced, aperture very elongate contracted anteriorly, broadly and beautifully regularly rounded at base.

This species is closely allied to the shell figured by H. Adams, 'P. Z. S.' for 1866, as *L. Swinhoei* from Formosa; it also resembles pl. 4, fig. 256

in the 'Conch. Iconica,' but not fig. 25a, which belongs apparently to a distinct species; *L. yunnanensis* may eventually prove to be an extreme variety of *L. Swinhoei*, characterized by the smaller body, ~~whorl~~, by the aperture being more contracted anteriorly and more rounded posteriorly, finally by the slightly more twisted columella. I have little doubt that *L. swinhoei* itself is only a synonym of *L. flava*, Phil., Zeits. Mal. 1851, p. 78. (I. Liew-kieu); certain it is that a shell sent me by M. Morelet, under the latter name from China, agrees exactly with Mr. Adams' figure in the 'P. Z. S.' Sowerby in the 'Conch. Iconica,' in his usual careless and worthless style, records and figures a species as *L. flava*, Morl.?

Long. 16, diam. 10; apert. long.  $11\frac{1}{2}$ , diam. 7 mil.

At Sanda in Yunnan.

*LIMNÆA ACUMINATA*, Lam., var. *RUFESCENS*, Gray.

*Limnæa rufescens*, Gray, Sowerby, Gen. Shells, pl. 7; Con. Indica, pl. 69, fig. 1.

A single specimen was found at Mandalay during the First Expedition.

*LIMNÆA LUTEOLA*, Lam., var.

*Limnæa luteola*, Lam., Anim. s. Vert., VI, pt. 2, p. 160; Con. Indica, pl. 70, figs. 5, 6.

Six specimens of a small variety were obtained at Mandalay with the preceding species.

*PLANORBIS EXUSTUS*, Desh.

*P. exustus*, Desh., Belanger, Voy. Ind. Orient., p. 417, pl. 1, figs. 11—13; Con. Indica, pl. 39, fig. 10.

Numerous specimens were obtained at Bhamô.

*PLANORBIS COMPRESSUS*?, Hutt.

*Planorbis compressus*, Hutt., J. A. S. B., 1834, p. 91 (Mirzapore); Con. Indica, pl. 99, fig. 1.

Four specimens were obtained at Sanda in Yunnan.

*CYCLOPHORUS SUBLÆVIGATUS*, Blf.

*Cyclophorus sublævigatus*, Blf., P. Z. S. 1869, p. 446 (Bhamô); Con. Indica, pl. 34, fig. 7. *Cyclophorus eximius*, Con. Indica, pl. 33, fig. 1, (not *C. eximius*, Mouss.)

The Museum is indebted to Dr. Oldham for several fine specimens of a form of this handsome species collected in Assam by Mr. Masters; they agree exactly in every respect with the type form, having light yellow-coloured apertures, &c., only they are a trifle larger in size; it is probably one of these specimens which is figured in the 'Con. Indica,' pl. 33, figs.

1, 2 (Khasi Hills !); it differs widely from Mousson's Javan species, by the acutely angled periphery, by its much more open umbilicus, and by the broad basal band, &c. A large series of a fine variety of this species has also been presented to the Museum by Mr. S. E. Peal, from the Naga Hills; this variety is of a slightly less depressed form, the umbilicus a trifle less open, but its most marked characteristic is the more circular aperture, which is of a deep crimson colour; I suggest that this handsome form be known as *C. sublavigatus*, var. *Pealiana*, after its discoverer. *C. balteatus*, Bens., from Pegu, is an extremely closely allied species.

Type, from Upper Burma, axis 29, diam. 46 mil.

Large form from Assam, axis 31, diam. 57 mil.

Type of var. *Pealiana*, from the Naga Hills, axis 30, diam. 56 mil.

#### CYCLOPHORUS FULGURATUS, Pfr.

*Cyclophorus fulguratus*, Pfr., P. Z. S. 1852, p. 52; Con. Indica, pl. 3, fig. 3.

[Var.] *Cyclophorus patens*, Blf., J. A. S. B., 1862; Con. Indica, pl. 3, fig. 5.

This species was found in great abundance at Mimboo and Prome; *C. patens*, Blf., from Pegu I consider only a variety, distinguished by its rounder and more thickened whorls, and especially by the less open umbilicus; *C. fulguratus* is one of the commonest Burmese land-shells.

M. Morelet states (Ser. Conch. IV, p. 283), that it is also found in Siam.

#### CYCLOPHORUS ZEBRINUS, Bens., var.

*Cyclophorus zebrius*, Bens.—J. A. S. B., 1836, p. 35b (Sylhet); Con. Indica, pl. 2, fig. 2.

Found in great abundance by Dr. Anderson at Bhamô, Hoetone, and Ponsee. It appears to be a variety of the common Khasi species, differing by its greater size and duller colouring.

#### SPIRACULUM ANDERSONI, Blf.

*Spiraculum Andersoni*, Blf., P. Z. S., 1869, p. 447 (Bhamô); Con. Indica, pl. 86, fig. 3.

The type specimens were found on the First Expedition at Bhamô, where the species was then very scarce; it was obtained again on the Second Expedition, living in tolerable abundance on the right bank of the Irawady, Second Defile, above the Great Cliff.

#### SPIRACULUM AVANUM, Blf.

*Spiraculum Avatum*, Blf. J. A. S. B., 1863, p. 319 (Ava); Con. Indica, pl. 184, figs. 7, 8.

A single specimen was found on the First Expedition at Bhamô, the species is quite distinct from *S. Andersoni*.

## PTEROCYCLUS INSIGNIS, Theob., var.

*Pterocyclos insignis*, Theob., J. A. S. B., 1865; Con. Indica, pl. 5, figs. 6, 7.

Three dead specimens only of this interesting form were found on the First Expedition on the Kakhyen Hills; the spire is a trifle more depressed than in typical specimens from the Shan States.

## PTEROCYCLUS FEDDENI, Blf.

*Pterocyclos Feddeni*, Blf., J. A. S. B., 1865, p. 93 (Thyot Myo); Con. Indica, pl. 134, fig. 1.

Tolerably abundant at Bhamô and above the great Cliff, Second Defile, Irawady.

## ALYCÆUS AMPHORA, Bens.

*Alycæus amphora*, Bens., A. & M., 1856 (Moulmein, &c.); Con. Indica, pl. 91, figs. 2, 3.

A few small specimens of this widely distributed Burmese species were found at Bhamô.

## BITHYNIA GONIOMPHALUS, Morl.

*Bithynia goniomphalus*, Morl., Rev. Zool. 1866, and Ser. Conch. III, pl. XIII, fig. 4 (Cochin China).

*B. Iravadica*, Blf., P. Z. S. 1869; Con. Indica, pl. 27, fig. 10.

A comparison of the type specimens in the Museum of *B. Iravadica* with typical specimens of *B. goniomphalus* from Cochin China (received from M. Morelet), prove the two species to be perfectly identical. Specimens from Siam of *B. Siamensis*, Lea (also received from M. Morelet), are exceedingly closely allied, and may prove to be only a variety; they differ, however, by their smaller size, and by the last whorl being rounded and not angulate, as is the case in *B. goniomphalus*. This species was obtained abundantly by Dr. Anderson at Ava, Mandalay, and Kabyuet.

## BITHYNIA TURRITA, Blf.

*Fairbankia* ? (*Bithynia*) *turrita*, Blf., P. Z. S., 1869, p. 446 (Kyoutong).

This most distinct and interesting species was not found on the Second Expedition; the single type in the Indian Museum, therefore, remains unique. The species is, I think, a true *Bithynia*, certainly not a *Fairbankia*. It was found at Kyoutong in Upper Burma.

## BITHYNIA MORELETIANA, n. sp.

In shape resembling *B. lutea*, Gray, (Con. Indica, pl. 37, fig. 7); spire peculiarly short, apex very obtuse and flattened, always eroded, but not decollated; whorls  $3\frac{1}{2}$ , the last obliquely produced; always imperforate, both in very young and very old shells; margins of aperture entire, broad.

ly reflected, produced and angled at base, outer margin rounded; epidermis dark olive-green; under the lens a minute spiral sculpture can be detected. Young specimens invariably show a sort of varix, formed probably at a period when their growth is arrested by some cause; this varix becoming absorbed in adult specimens. Above 200 specimens were found at Yaylay-may.  
 Long. max.  $8\frac{1}{2}$ , min.  $7\frac{1}{2}$ , diam. max. 6, min.  $7\frac{1}{2}$  mil; long. anfract. ult. 7; long. apert.  $5\frac{1}{2}$ , diam. 3 mil.

This species can easily be distinguished from the Indian *B. cerameopoma* and *B. lutea*: it is imperforate, has fewer whorls, a shorter and more obtuse spire, the columellar margin is less acutely angled at base, the epidermis green instead of brown.

#### MARGARYA, n. gen.

This remarkable shell is very difficult to classify, owing to its great analogy to two fresh-water genera, *Paludina* and *Melania*. I think, however, there is little doubt but that it will have eventually to rank as a sub-genus of *Paludina*. *Margarya*, so named in honour of its discoverer, who unfortunately shortly after was murdered near Momein by the Chinese, is characterized by its produced, melania-like spire, composed of scalariform, rapidly increasing whorls, with very distinct suture; apex obtuse, sculptured with prominent spiral ribs; rimate (or umbilicate?); margins of aperture rounded, not continuous; animal and operculum unknown.

#### MARGARYA MELANIOTIDES, n. sp.

Shell large, spire produced, melania-like, with very deeply excavated suture, apex obtuse; whorls six, convex, the first two flat and obtuse, the third large and tumid (bigger in proportion than the fourth); the four last whorls are girt with three nearly equally distant, raised, irregularly nodulose keels, the middle one much the largest, having its nodules more developed and of a more or less compressedly transverse shape; umbilicus very small, almost entirely covered by the reflected columella; aperture almost circular, nearly as broad as high; columella short, evenly rounded, moderately reflected over the shallow umbilicus; a slight callous between the columella and outer lip; remains of an epidermis distinctly traceable.

A broken specimen of four whorls only, long. 67, diam. 47; anfract. ult. 44; apert. alt.  $28\frac{1}{2}$ , lat.  $27\frac{1}{2}$  mil.

A perfect, but not quite adult, specimen (6 whorls), long. 52, diam. 34; anfract. ult.  $35\frac{1}{2}$ ; apert. alt. 23 mil.

Four dead and water-worn specimens of this exceedingly interesting new form were picked up on the shores of Lake Tali in Yunnan by the late Mr. Margary and were given by him to Dr. Anderson, who has expressed

his desire that the form should be named in honour of the unfortunate discoverer.

**PALUDINA CHINENSIS, Gray, var. AMPULLIFORMIS, Sow.**

*Paludina Chinensis*, Gray, Griff. An. K. 1834 (China).

*P. lecythis*, Bens., J. A. S. B., 1836 (Sylhet).

*P. lecythoides*, Bens., A. & M., 1842 (Chusan).

*P. ampulliformis*, Soul., Voy. Bonite, 1852, pl. 31, fig. 25—27 (Cochin China).

*P. lecythis*, Bens., var. *ampulliformis*, Eyd. and Soul., Con. Indica, pl. 77, fig. 7 (Upper Burma).

The types of Benson's *P. lecythis* are in this Museum; they are a very large, globose, and thin form of *P. chinensis*; pl. 76, fig. 6, in the 'Con. Indica' fairly represents Benson's form; this variety has been recently rediscovered in India by Major Godwin-Austen, who found it at Manipur; Benson's types of *P. lecythis* were more probably found in the same locality than in Sylhet proper.

Found in great abundance, about 5000 ft. above the sea, at Nantin, Mungla, Momein, and Hotha in Yunnan; there are two forms existing everywhere together which pass by insensible gradations the one into the other: one is a short tumid variety like typical *P. lecythis*, but of stouter texture and with the whorls much more distinctly angulate, appearing to me to be the form called *P. ampulliformis* by Souleyet: the other has a more produced spire, resembling that of *P. lecythoides*; apparently both Yunnan forms can be distinguished from Chinese specimens by the markedly shorter whorl, some one or two, however, show in this respect so close an approach to var. *lecythoides* that I am afraid the character cannot be relied upon to separate *P. chinensis* and its var. *lecythoides* from var. *lecythis* and var. *ampulliformis*.

**PALUDINA DISSIMILIS, Müll., var. DECUSSATULA, Blf.**

*P. dissimilis*, var. *decussatula* (vol *P. decussatula*), Blf., P. Z. S. 1869, p. 445, (Ava).

Differs from *P. helixformis*, v. Fr. by the less rounded whorls, by the more produced and not decollated spire, and by the less distinct angulation at the periphery, which is distinctly banded with a white belt, obsolete in the Pegu form. Both differ from typical Bengal *P. dissimilis* (*P. praemorsa*, Bens.) by the considerably more developed sculpture, more angular last whorl, less rounded aperture, and less open umbilicus, and by the more uniform green colouration; the white belt is also less distinct than it is in most Bengal specimens; it is even less like the South Indian var. *variata* and var. *obtusq.*

Common at Ava and Bhamô.

**var. VIRIDIS, Rv.**

*P. viridis*, Hanl. MSS., Rv., Con. Icon., fig. 20 [Loc. ?].

A fine striking form, easily distinguishable from the preceding by the more produced spire, obsolete belt, &c., exactly resembling the above figure

of Reeve, but a trifle smaller. A few specimens only were found at Ka-byuet.

Long.  $29\frac{1}{2}$ , diam. 21 mil.

*PALUDINA SIAMENSIS*, v. Fr., var. ?

*Vivipara Siamensis*, v. Fr., Zool.-bot. Ges., Wien, 1865, pl. 22, (Siam).

The Museum possesses a single typical specimen from Siam, which seems to present no distinctive characters, except in its greater size, from the numerous, but all unfortunately young, specimens found alive at the Second Defile of the Irawady and at Yaylaymaw.

*PALUDINA BENGALENSIS*, Lam., var. *DOLIARIS*, Gld.

*Paludina bengalensis*, Lam., var. *digona*, Blf., P. Z. S., 1869, (Bhamô.)

*P. doliaris*, Gld., Proc. Bost. Soc., vol. I. p. 144.

Countless varieties of this well known shell are to be found everywhere throughout the Indian region. The form from Bhamô, called var. *digona* by Mr. Blanford, the type of which is in the Museum, is very incorrectly figured in the 'Con. Indica,' pl. 115, fig. 7, the characteristic angulation of the last whorl not being shown; it is apparently the widest spread variety of all; in the Museum are specimens almost undistinguishable from one another from Calcutta, Mandalay, and Siam (received from Morelet as "*P. lineolata*, Mouss."). A small and less angular form of var. *digona* was obtained at Myadong, having the last whorl more produced and separated. Another form sent me by M. Morelet from Cochin China as "*P. polygramma*, Mart.", is also found in Pegu and Calcutta. An interesting form near var. *digona* was found at Shuaygoomyo: it differs by the remarkably developed transverse sculpture, by the peculiar green of the epidermis, which has less of a yellow tinge, and by the umbilicus being more open than in any other specimens I have seen of this protean shell; this form is near *P. oxytropis*, Bens. (Con. Indica, pl. 76, fig. 5) from Manipûr, though the latter I consider a good and distinct species. Since the preceding was written, M. Morelet has suggested (Ser. Conch. IV, p. 306), that probably both *P. polygramma* and *P. lineolata* are merely varieties of *P. Bengalensis*; he states that both forms are found in Cochin China, and he identifies the two former for certain as merely varieties of *P. sumatrensis*, Dkr., Mal. Bl. 1852.

*MELANIA (STRIATELLA) TUBERCULATA*, Müll.

*Nerita tuberculata*, Müll., Hist. Vorm. p. 191, (Coromandel).

Two forms of this very common and variable shell were found abundantly in the old channel of the Irawady at Myadong; the commoner of the two somewhat resembles pl. 74, fig. 1, of the 'Con. Indica,' but is more richly coloured, with the brown band at base remarkably broad and

distinct; the whorls are a little narrower and more produced, the transverse ridges very acute and prominent, the longitudinal ribs nearly, or altogether, obsolete on the last two or three whorls; the upper two or three whorls are, as usual, decollated.

Long. max.  $27\frac{1}{2}$ , diam. 9 mil.

The other form is shorter and more rounded, of a pale green, with scarcely any brown spots or markings and with the basal band nearly, or altogether, obsolete; the transverse ridges are irregular and less acute, the longitudinal ribs, on the contrary, strongly developed, becoming obsolete only below the middle of the last whorl; decollated like the preceding.

Long. max. 20, diam. 8 mil.

#### MELANIA (MELANOIDES) JUGICOSTIS, Bens.

*Melania jugicostis*, Bens. MS., Con. Indica, pl. 110, figs. 8, 9. (Tenasserim Rv.).

Unfortunately, only two specimens of this interesting species were brought back by Dr. Anderson; they were found at Myadounng with the preceding and following species. The species seems to me to belong rather to *Melanoïdes* than to *Plotia*; it certainly a good deal more resembles the Chinese *M. cancellata*, Bens., than *Plotia scabra*; in either case it is a very distinct and well characterized species, and is admirably figured in the 'Con. Indica.' Shell small, slightly decollated; whorls five, abruptly angular, smooth and shining, with a few rather distant, somewhat obsolete and irregular, transverse ridges on the lower half of the last whorl; longitudinally angularly ribbed, ribs very distant, thick and prominent, almost varicose, eight of them on the last whorl, disappearing towards the base; very pale green, with no markings except a subobsolete brown band at base.

Long. 12, diam. 6 mil.

#### MELANIA (MELANOIDES) IRAVADICA, Blf.

*Melania Iravadica*, Blf., P. Z. S., 1869; Con. Indica, pl. 71, fig. 1.

This seems to me to be the Upper Burmese form of a shell described by Gould as *M. baccata*, Proc. Bost. Soc., 1847. Mr. Theobald has presented a series to the Museum from the Upper Salween River, well figured in the 'Con. Indica,' pl. 75, figs. 3, 11 and by Brot in the 'Conch. Cabinet,' pl. 9, fig. 6; at first sight they seem to differ considerably from the form described as *M. Iravadica*; there is scarcely, however, any real difference, except the larger size and more distinct sculpture of typical *M. baccata*, which has three rows of nodules, the upper one of which is altogether obsolete in *M. Iravadica*; in one or two specimens, however, of the former this row is also obsolete. The type specimens of *M. Iravadica* are in the Indian Museum.

Typical *M. baccata*, of three whorls only, long  $38\frac{1}{2}$ , diam. 20 mil.

*M. Iravadica*, from Yaylaymaw, of three whorls only, long. 30, diam. 17 mil.

At the latter locality the species was found in great abundance by Dr. Anderson on the Second Expedition, as it was also on the First Expedition by Blamô and Manwyne; the small specimens, so well figured by M. Brot (Matér. Mél. iii, pl. 4, figs. 12—13) were from the latter locality; these specimens had been given in exchange by the Museum to the late Dr. Stoliczka, by whom they were sent to M. Landauer.

#### MELANIA (MELANOIDES) REEVEI, Brot.

*Melania (Melanoides) Reevei*, Brot, Matér. Mél. i., p. 46 and Conch. Cab., pl. 11 fig. 4.

*M. baccata*, Rv., pl. 20, fig. 144 B (not of Phil.).

A rather young specimen of this very distinct species was well figured as above by Reeve; an adult specimen of the same species is figured in the 'Con. Indica,' pl. 72, fig. 3. It is a well characterized species, quite distinct from *M. variabilis*, *peguensis*, and *gloriosa*, and of these three it is nearest allied to the last. There are specimens in the Museum from Nongbenzick in Pegu; it was also obtained plentifully at Mandahay on the First Expedition, and on the Second Expedition at Myadoun.

#### var. IMBRICATA, Hanl.

*Melania Reevei*, var., Brot., Conch. Cab., pl. 11, fig. 4 A.

*Melania Reevei*, var. *imbricata*, Con. Indica, pl. 153, fig. 4.

About twelve specimens of this variety were obtained at Yaylaymaw. It can be easily distinguished from the type form by its more developed sculpture; it has the same characteristic regular transverse ridges below the suture (four or five in number), but in addition has throughout other interrupted transverse ridges, broader than those near the suture and wider apart; it has also numerous longitudinal ribs, possessing a tendency at times to become obsolete (varying much in this respect in individual specimens), these ribs commence at the termination of the sutural row of regular transverse ridges, and are generally distinct only on the last few whorls; the columella is stained a rich brown colour.

Var. *imbricata*, of nine whorls, long. 65, diam. 26 mil.

#### MELANIA (PLOTIA) SCABRA, Müll.

*Duccinum scabrum*, Müll., Hist. Verm., p. 136 (Coromandel); Con. Indica, pl. 73, figs. 1-4.

*Melania scabra*, Müll.

A few specimens were found at Myadoun; they agreed perfectly with Reeve's fig. 156 B (*M. spinulosa*, Lam.).

## PALUDOMUS ANDERSONIANA, n. sp.

Large and globose; spire produced and pointed; of a very striking greenish yellow colour, with four intense black bands on the last whorl, the one at the suture and the two near the base about the width of the broadest band on *P. ornata*; the second band from the suture twice this width, this latter, in all but very old specimens, is very distinctly visible within the aperture; whorls seven, the first two or three generally decollated, transversely superficially ridged, ridges more or less obsolete towards the centre of the upper whorls, one of them below the suture more prominent than the rest; columella pure white; the operculum constantly differs on its inner side from those of the other Burmese species by the remarkably raised and very rugose nucleolar portion and by the distinct, though minute, granular margin. Dr. Anderson obtained several hundred specimens in all stages of growth at Mandalay, Ava, Bhamô, Kabyuet, and Myadoung. One of the best distinguishing marks from its var. *Peguensis* is the great width within the aperture of the second brown band; the band nearest the base, on the other hand, is comparatively smaller; in *P. Peguensis* (even in young specimens) the two upper bands are altogether wanting, the third very narrow, the last broad and diffused over the basal portion of the columella. This is probably the *Paludomus* sp. of Theobald from the Shan States, J. A. S. B., 1865, p. 264.

Long. max. 29, diam. max. 22 mil.

## Var. PEGUENSIS (an sp. n.?)

*Paludomus regulata*, Bens., var., Con. Indica, pl. 108, fig. 6.

Differs from the preceding by the slightly more rugose sculpture, by its more decollated apex, by the less cylindrical whorls and less produced and pointed spire (more apparent in young specimens), by the columella being apparently invariably faintly stained with brown, by the almost entire apparent absence of colouration on the last whorl, especially in the absence of the second broad band within the aperture. Unfortunately, all the specimens have lost their opercula. The specimen figured in the 'Con. Indica' is a very old decollated one.

Type of variety from Pegu, long. 21, diam. 16 mil.

## PALUDOMUS ORNATA, Bens.

*Paludomus ornata*, Bens., A. & M., 1856, 498; Con. Indica, pl. 108, fig. 8.

Specimens of this very handsome species from Ava, Pegu, and Mandalay are in the Museum Collection; it is well characterized by its seven produced and solid whorls, acute and prominent spire; the Ava specimens are not decollated, though quite adult; those from the other two localities

have, however, all lost their first three or four whorls; both young and old shells are perfectly smooth, with the exception of a deeply incised spiral groove below the suture; the figure in the *Con. Indica*, pl. 108, fig. 8, is excellent; perhaps it scarcely shows sufficiently clearly the three broad spiral brown bands; from the peculiar thickness, even, of young shells, these bands are, however, often scarcely visible; the operculum resembles that of *P. regulata*, Bens., only it is little flatter, both differ considerably from that of *P. Andersoniana*, being much smoother on their inner side.

Long. 24, diam. 16 mil.

#### *PALUDOMUS REGULATA*, Bens.

*Paludomus regulata*, Bens., A. & M., 1856, p. 496; *Con. Indica*, pl. 108, fig. 5.

This species was not obtained by Dr. Anderson; the Museum, however, possesses some hundred specimens from Prome and Thyet-Myo in Pegu; the specimens from the latter locality are typical ones from the collection of Mr. Theobald; the shell is admirably figured as above in the '*Con. Indica*'; the spiral, broad, flattened ridges throughout are very characteristic, as is also its slightly compressed, angular shape; the operculum differs from that of *P. Andersoniana*, by being more concave and less broad on its inner side, the nucleolar part is less raised and much more rugose, the broad polished margin (under the lens) is destitute of sculpture, instead of being minutely granular.

Long. max. 24½, diam. 16 mil.

#### *PALUDOMUS BURMANICA*, n. sp.

Shell small, very thick, spire depressed, in shape closely resembling the European *Litorina obtusata*; only two whorls, the others decollated in both young and old specimens; smooth, with a few irregular striæ at suture; columella very thick, pure white; aperture somewhat compressed, as in typical *P. labiosa*, not globosely expanded as in *P. Blanfordiana*; in all the ten specimens found, only three instead of four bands, the upper one exceedingly broad, covering nearly half the last whorl, the middle one narrow, the basal one broad, but not diffused over any part of the columella, these bands are of the most intense black within the aperture, even in very old, thick specimens; epidermis unusually thick, dark olive-green, closely covered with regular raised pustules of a lighter colour.

Yaylaymaw and also Mandalay.

Long. 14½, diam. 12 mil.

The operculum is like that of *P. regulata*, a shade darker in colour, nucleolar portion on the inner side a little more distinctly spirally rugose. The broad and richly coloured bands (only three in number), pure white columella, and peculiar epidermis are the principal distinguishing characters from typical Tenasserim *P. labiosa*; it is, I consider, quite distinct from *P. Blanfordiana*.

## PALUDOMUS BLANFORDIANA, n. sp.

*Paludomus labiosa*, Con. Indica, pl. 108, fig. 9, (not of Bens.) "Tongooop."

There are good many specimens in the Museum from Pegu and Ava, also from Gowhatty in Assam, agreeing exactly with the shell figured as above in the 'Con. Indica'; there are also seven typical specimens of *P. labiosa*, collected by Mr. Theobald in Tenasserim; these latter are a good deal smaller and less angularly globose than the Pegu species, their columella is more vividly stained with brown, the brown bands are less regular and distinct (showing in an especially marked way within the aperture), and finally both young and old specimens are truncated, which is apparently never the case with the former; the sculpture of both is the same, quite smooth, except for a few irregular spiral striæ below the suture; the typical specimens of *P. labiosa* are without opercula; those of *P. Blanfordiana* resemble opercula of *P. regulata*, though they are even less rugose, the spiral striæ of the nucleolar portion of the inner side being distinct and regular (seen through the lens).

*P. labiosa* from Tenasserim, long. max.  $12\frac{1}{2}$ , diam. 10;

*P. Blanfordiana*, type from Ava, long. max. 19, diam. 15 mil.;

*P. Blanfordiana*, var. from Assam, long. 20, diam. 15 mil.

This species resembles as closely *P. ornata* as it does typical Tenasserim *P. labiosa*; specimens from Assam differ in no respect from Burmese ones, except by the spire being a trifle more produced, this locality for the species is interesting, it appears to be very abundant there.

## AMPULLARIA THEOBALDI, Hanl.

*A. Theobaldi*, Blf., Con. Indica, pl. 115, fig. 2, (Loc. ?)

? *A. maura*, Rv., var., Con. Icon. fig. 57 (Loc. ?)

Unfortunately none of the 16 specimens collected by Dr. Anderson at Bhamô are quite full-grown, the outer lip in all of them being thin and sharp; in the depression of the spire they agree with Reeve's figure of *A. maura*, as well as the typical figure of *A. Theobaldi*; the umbilicus is open, agreeing exactly with the latter figure; the colouration and shape of the aperture are also the same; I think it very doubtful, however, if it can be separated as a distinct species from the common Assam form, from which it only seems to differ by its larger size, less produced spire, slightly more open umbilicus, and in the colouration being a shade more vivid; in the latter two respects, however, some few Assam specimens approximate most closely.

## UNIO MARGINALIS, Lam., var. SAVADIENSIS, nov.

*Unio marginalis*, Lam., Anim. s. Vort.; Con. Indica, pl. 9, fig. 6, (sp. juv.)

This variety is abundant at Sawady in the Thengleng stream, also at Bhamô and at Shuaygoomyo; four young specimens found at Myadoun

probably also belong to this form. The nearest figured variety is *obesa*, Hanl., Con. Indica, pl. 44, fig. 7, from the Irawady; var. *savadiensis* is of a more ovate shape, of a slightly thinner texture, the nacre is of a light salmon- or cream-colour, instead of the ordinary bluish white tinge characteristic of var. *obesa*, the difference of colour in the nacre is constant both in young and old shells; the lateral teeth are more convex, the cardinal ones a little less strongly developed; young specimens of both varieties are prominently winged, as in var. *lamellatus*, pl. 44, fig. 7, of the Con. Indica; externally young specimens are of a gamboge-yellow colour, tinged with bright green on the wing.

Long. max. 113, lat. max. 68 mil.

var. CORRIANUS, Lea.

*Unio Corrianus*, Lea, Trans. Am. Phil. Soc. V., pl. 9, fig. 25;

*U. marginalis*, var. *Corriana*, Con. Indica, pl. 44, fig. 4.

Four magnificent specimens of this very marked variety were found at Yaylaymaw; the nacre is of the most beautiful salmon-pink colour; the only difference from typical Bengal specimens is that the texture and teeth are thicker, and this is the case also with specimens from Pegu.

Long. 115, lat. 55 mil.

UNIO FEDDENI, Theob.

*Unio Feddeni*, Theob., J. A. S. B. 1873, pl. 17, fig. 3.

Tolerably abundant in paddy-swamps at Bhamô, also at Yaylaymaw. I feel quite sure that Mr. Theobald is wrong in recording this species as found in the Pempunga, Central India; typical specimens from Mr. Fedden are marked in the carefully kept collection of Mr. H. F. Blanford as from Burmah; the specimens found by Dr. Anderson in Upper Burmah confirm Mr. Blanford's record of the locality of the original type form, as opposed to that given by Mr. Theobald; Mr. Fedden collected in both localities.

UNIO BURMANUS, Blf.

*Unio Burmanus*, Blf., P. Z. S., 1869, p. 450 (Bhamô); Con. Indica, pl. 42, fig. 1.

This form was not found on the Second Yunnan Expedition. Full-grown shells are narrower and more produced, with the umbones much less prominent, and the rugose sculpture also less developed than is the case with *U. Bhamoensis*.

The types of *U. Burmanus* from Bhamô are in the Indian Museum.

## UNIO BHAMOENSIS, Theob.

*Unio Bhamoensis*, Theob., J. A. S. B., 1873, p. 207, pl. 17, fig. 1.

*Unio Mandalayensis*, Theob., J. A. S. B., 1873, p. 208, pl. 17, fig. 2.

Not uncommon at Myadoun and Yaylaymaw; found also on the First Expedition at Mandalay, Bhamô, and Shienpagah. The two above forms can certainly not be separated, as indeed might have been surmised from Mr. Theobald's remarks in the original description, large series from one locality showing that both varieties run one into the other. The Pegu form mentioned in the original description of *U. Bhamoensis* differs a good deal more from both than the Bhamô from the Mandalay one; it is a pity Mr. Theobald did not give this Pegu variety a name, instead of the Bhamô one.

## UNIO FRAGILIS, n. sp.

? *Unio foliaceus*, Gld., Proc. Bost. Soc.; Con. Indica, pl. 42, fig. 3.

? *U. Peguensis*, Anth., Am. J. Con., pl. 25, fig. 2.

Ten specimens from Yaylaymaw only differ from the Pegu form, in that the epidermis, except on the posterior angle, is quite smooth; unfortunately they all seem young shells; the two biggest are exceptionally tumid, in this respect differing from the others, as also from the Bhamô and Shienpagah specimens; in all of the above the nacre is less yellow-tinged towards the umbones, and the teeth thinner than in *U. foliaceus*. It is a form extremely close to, if not identical with, the *U. comptus*, Desh. (Nouv. Archives X, Pl. 6, fig. 3—4), stated by MM. Crosse and Fischer to be the *U. Sumatrensis* of Lea.

Type of *U. fragilis* from Yaylaymaw: long. 34, lat.  $17\frac{1}{2}$ , crass.  $11\frac{1}{2}$  mil.

Three specimens from Bhamô, all young: long. max. 43, lat. 24, crass. 18 mil.

Thirty specimens from Shienpagah, all young: long. max. 32, lat. 17, crass.  $9\frac{1}{2}$  mil.

Specimens of *U. foliaceus*, from Pegu, long. 58, lat.  $22\frac{1}{2}$ , crass. 17 mil.

## UNIO PUGIO, Bens.

*Unio pugio*, Bens., A. & M., 1862, p. 193; Con. Indica, pl. 10, fig. 7.

Abundant at Myadoun, Bhamô, and Yaylaymaw. Very young specimens are rugose anteriorly, especially near the umbones.

Long. 57, lat. 27, crass. 20 mil.

## UNIO BONNEAUDI, Eyd. &amp; Soul., var.

*Unio Bonneaudi*, Eyd. & Soul., Mag. de Zool., 1838, pl.; Con. Indica, pl. 10, fig. 6, and pl. 46, figs. 5, 6.

Very abundant at Myadoun, Irawady Second Defile, Shuaygoomyo, Yaylaymaw, and Bhamô. It varies considerably in being more or less rugose in sculpture.

Long. max. 52, lat. max. 29, crass. 24 mil.

#### UNIO ANDERSONIANA, n. sp.

This species was found at Myadoun in tolerable abundance, together with *U. Bonneaudi* and several other species; two specimens were also obtained on the First Expedition at Shienpagah. It is next allied to *U. pachysoma*, Bens., and to some of the varieties of *U. cæruleus*, Lea. It is easily distinguished from *U. Bonneaudi* by its more irregular shape, thinner texture by the acute angulation, greater production posteriorly, and by the more developed sculpture; a constant character also is the pink colour of the nacre, which in *U. Bonneaudi* is bluish white, this is equally distinct and characteristic in young as in old specimens.

Type from Myadoun, long. 32, lat.  $15\frac{1}{2}$ , crass.  $11\frac{1}{2}$  mil.

Specimen of *U. Bonneaudi* from Myadoun, long. 31, lat. 18, crass. 13 mil.

#### CORBICULA LAMARCKIANA, Prime.

*Corbicula Lamarckiana*, Prime, Ann. Lyc. N. York, 1867 (Mt. Laos, Cambodia).

Specimens obtained at Hotha and Momein (5,500 feet) in Yunnan, and also at Mandalay, agree exactly with Prime's original figure. Major Godwin-Austen also found a small form of this well-marked species at Manipûr, in the Kuchaï stream.

Long.  $28\frac{1}{2}$ , lat.  $20\frac{1}{2}$ , crass. 13 mil.

#### CORBICULA YUNNANENSIS, n. sp.

Medium-sized specimens from Yaylaymaw agree fairly with Prime's figure and description of *C. Linneana*, (Ann. Lyc. N. York, 1867, Cambodia), the principal difference being the less truncate anterior side. Shell large, thick, transverse, inequilateral, compressed, rather abruptly tumid towards the umbones; anteriorly moderately produced and rounded, posteriorly produced and truncate (exactly as in Prime's figure of *C. Linneana*); lateral teeth curved, the anterior a little more so than the posterior; no lunule; epidermis dark brown, striæ regular and close; interior violet, of a darker shade near the margin. This species is more inequilateral, more tumid near the umbones, and more regularly sulcated than *C. Mülleriana*, Prime (*loc. cit.*), from China, which, however, it also closely resembles.

Type from Manwyne in Yunnan (4,000 feet): long. 39, lat. 33 mil.

Yaylaymaw (all young): long.  $21\frac{1}{2}$ , lat. 17, crass.  $11\frac{1}{2}$  mil.

## CORBICULA ANDERSONIANA, n. sp.

Rather small, thin, subequilateral, transversely ovate, tumid; medium-sized specimens closely resemble in shape *C. inaequilateralis*, Prime, both sides are obtusely rounded, epidermis bright green, interior violet, paler near the margin. This species is quite distinct from the other Burmese and Indian ones, it is, however, exceedingly close to *C. tumida*, Desh., P. Z. N., 1851, from Borneo, as figured by Issel.

Type from Momein in Yunnan: long.  $20\frac{1}{2}$ , lat. 12 mil.

IV.—*Descriptions of three new Species of Birds of the Genera Pellorneum, Actinura, and Pomatorhinus; lately collected in the neighbourhood of Saddy, Assam, by MR. M. J. OGLE of the Topographical Survey.*—  
Major H. H. GODWIN-AUSTEN, F. R. G. S., F. Z. S., &c.

(Received March 29;—Read April 4, 1877.)

## 1. PELLORNEUM PECTORALIS, n. sp.

*Desc.*—Head to nape dull dark chestnut; back, wings, and tail umber-brown, the last indistinctly barred and with narrow pale tips, the outer primaries edged paler. Lores and frontal feathers pale, tipped with pale black, extending as an obscure supercilium to the nape, where the feathers become broadly dingy white on their upper web, dark brown on the lower; those on the back of the neck are broadly black-centred. The ear-coverts are umber-brown, darker behind, forming a crescentic margin again bordered lighter. The chin is pure white for three-quarters of an inch; a dark gorget of broadly black-centred feathers then crosses the upper breast, the centering of the feathers becoming very large, oblong, and conspicuous on the elongate feathers of the sides of the neck, but paler and less defined on the flanks. From the gorget all beneath is pale rufescent ochre. The under tail-coverts are dark, bordered with white.

Legs pale ochre. Irides vermilion.

|   | Wing. | Tail. | Tarsus. | Bill at front. |
|---|-------|-------|---------|----------------|
| ♂ | 3.0"  | 3.0"  | 1.12"   | 0.70"          |
| ♀ | 3.0   | 3.0   | 1.0     | 0.63           |

*HAB.*—Saddy, Assam (M. J. Ogle).

This species is nearest and closely allied to *Pellorneum Mandelli*, W. Blanford, described from Darjeeling, which is the same as Hodgson's *P. Nepalensis*, a MS. name never published. It is a larger bird as regards wing, and the legs are more robust. The principal difference lies in the far larger extent of the dark streaking on the sides of the neck: the dark centred feathers are longer and broader than in *P. Mandelli*, the black oblong spots

being 0·4 in. by 1·3 in. in this new form as against 0·3 by 1·0, while those on the upper nape are bordered with white above; the top of the head is dark chestnut, opposed to a dull rufous umber in the Darjiling species. Yet the greatest departure is in the abrupt termination of the white chin, succeeded by the ochraceous tint of the rest of the under parts, while the black centerings of the feathers are so broad and closely distributed as to form a decided dark gorget, whence they spread away down the sides of the breast. The feathers of the head and nape are more lengthened and fuller than in the other species.

We appear to have in this genus—all near allies:—

1. *PELLORNEUM RUFICEPS*,\* Swainson.

South India.

2. *PELLORNEUM MANDELLII*, W. Blanford.

Sikkim, and the Garo and Khasi Hills.

3. *PELLORNEUM PECTORALIS*, G-A.

Eastern Assam.

4. *PELLORNEUM TICKELLI*, Blyth.

*P. minor*, Hume, S. F., 1873, p. 298, from Tenasserim.

*P. subochraceum*, Swinhoe, A. M. N. II., 1871, p. 257, also from Tenasserim.

Burmah and Tenasserim.

I cannot help thinking that the two last names are only synonyms. In the list of Birds from Tenasserim (Stray Feathers, Vol. II. p. 476.), the very country whence Tickell sent his specimens to Blyth, *P. minor* is recorded as common, but *P. Tickellii* as not yet obtained. Comparing specimens lately received from Tenasserim with the original description and with a specimen in the Indian Museum (also from Tenasserim) which there is every reason for believing to be one of the original types, I can arrive at no other decision but that *P. minor* and *P. subochraceum* are nothing else than *P. Tickellii*; nor is it likely that two distinct species whose dimensions are so exceedingly close are to be found in so limited an area.

## 2. *ACTINURA OGLEI*, n. sp.

*Desc.*—Above rich umber-brown with a sienna tinge, strongly rusty on the head and nape, the soft feathers of the back and rump are very finely and indistinctly crossed with narrow bars. A well-developed frontal band of white having the shafts of its feathers black, merges into a well-defined pure white supercilium and is continued over the black ear-coverts and down the side of the neck, where the white feathers become bordered with black, the supercilium thus terminating in scattered spots. This white supercilium is bordered above with black. Lores dark, chin pure white,

\* Is given in Blyth's List of the Birds of Burmah, but I doubt if true *P. ruficeps* is found out of Southern India.

breast grey, flanks and abdomen dull earthy brown. Wings and tail rich umber narrowly barred with black-brown, the tail having about 24 such bars. Irides crimson lake; legs and feet umber-brown.

Length about 6", wing 2·8", tail 2·8", tarsus 1·1", bill at front 0·60".

The bill, which is stronger and deeper than in any other species of the genus, is black above, grey below.

HAB.—Shot on Maubúm Tila, on the Tenga Pani river, near Saddya, at 800 ft. (M. J. Ogle).

This is another new form for which we have to thank Mr. Ogle, after whom I have much pleasure in naming it. It is one of the most beautiful and distinct forms of the genus, its white chin and superciliary stripe being a most conspicuous departure from the type of coloration possessed by the other species.

*Actinura Oglei* in the coloration of the head and nape, and in its white throat, has remarkable affinities for *Turdinus guttatus*, Tickell, from Texas. This last bird can hardly find a place in the genus *Turdinus* as exemplified by such forms as *T. brevicaudatus* and its allies. In the stout legs and feet it is akin to *Actinura*, and in the form of the nostrils it is also like *Actinura Oglei*. The principal departure to be noted is in the absence of barring on the wings and tail, but this is to be discerned, though it is indistinct, and is noted by Tickell in his original description, when the barring was no doubt more apparent than it now is in the faded type specimen in the Indian Museum, Calcutta. In *A. Oglei* this barring, I notice, is far less conspicuous than in *A. Egertoni*, *A. Waldeni*, &c. Altogether these two birds present a most instructive case of close generic relationship.

### 3. POMATORHINUS STENORHYNCHUS, n. sp.

*Desc.*—Above pale umber-brown with an ochraceous tinge, richer brown on the head, a more umber tint on the tail and wings, a narrow pure white supercilium from base of bill over the eye to the ear-coverts, but not extending further. Lores black, passing under the eye to the ear-coverts, which are grey-black and bounded posteriorly with rufous brown. Chin and upper throat pure white, breast and abdomen pale rufescent, flanks and under tail-coverts pale ochraceous brown.

Bill very long, tapering, curved, and much compressed; bright orange-red. Legs and feet horny grey.

♂ Length abt. 8"; wing 4"; tail 4·4"; tarsus 1·35"; bill at front 1·45",  
♀ " 3·25; " 3·9; " 1·20; " 1·15.


The female is thus very decidedly smaller than the male.

HAB.—Obtained on Maubúm Tila, on Tenga Pani River, near Saddya at 800 ft. (M. J. Ogle).

This beautiful *Pomatorhinus*, which with the preceding species was discovered during the past cold season, in its very slender and narrow bill approaches the *Xiphorhamphus* form more than any other species of this group of Scimitar Babblers. In its coloration it reminds one of *Pom. ferruginosus*.

The claw of the inner toe is smaller than the outer, and all the claws are rounded off at the tip so as to have a peculiarly blunt gouge-like appearance.

The collection also contains several other new and interesting species, some of which I am unable to determine satisfactorily out here, but which shall be described in more detail in my next List of Birds from the N. E. Frontier. I may mention (i) an *Abrornis* with yellow chin, which I propose naming *A. flavogularis*; (ii) *Chleuasicus atrosuperciliaris*, intermediate in size between *Paradoxornis ruficeps* and *Ch. ruficeps*; (iii) *Horornis fuliginiventer*, Hodg.; (iv) *Turdinus Williamsons* quite distinct from the type of *T. brevicaudatus*, Blyth, which is of a strong rufous colour on the breast, abdomen, and under tail-coverts; this rufous colour pervades the back, and the spotting on the secondaries is smaller and less conspicuous than in the specimen lately received from Saddya.



V.—*Note on the Variation of the Barometric Tides in connection with Diurnal Land- and Sea-Breezes.*—By HENRY F. BLANFORD, *Meteorological Reporter to the Government of India.*

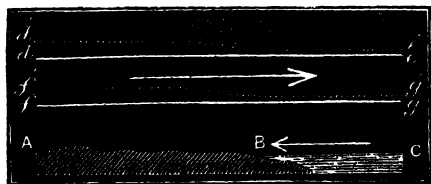
(Received January 29 :—Read March 7, 1877).

The theory of the diurnal land- and sea-breezes on sea-coasts is perhaps one of the most familiar of meteorological topics, and the subject finds a place in all our handbooks of meteorology and physical geography, as an illustration of winds of convection. It has long been surmised, as a deduction from the theory, that the daily oscillations of pressure over the sea and the land, in the neighbourhood of coast-lines, must shew marked differences; the pressure being higher over the land during the night and early morning, over the sea during the afternoon and evening hours. Hitherto, however, as far as I am aware, this inference has never been confirmed by the results of actual observation; and the following facts, relating to the diurnal variation of pressure over the head of the Bay of Bengal between 60 and 120 miles from the coast of the Sunderbans, will therefore have that interest which must always attach to the confirmation of a familiar theory. At the same time, I may point out, the view which I put forward at a recent meeting of the Society, *viz.*, that a considerable transfer of air takes place in the day-time from the land to the sea, also receives confirmation; and, regarded as a whole, the resulting phenomenon is, to my mind, a very beautiful and at the same time simple solution of a problem in meteorological physics.

The data which have given occasion to this communication have reached me only within the last few weeks. They are the reduced logs, relating to Indian seas, for the month of January, which have been accumulated for many years past by the London Meteorological Office, established by the late Admiral Fitzroy, and now under the direction of Mr. R. H. Scott and Captain H. Toynbee. The observations have all been made with compared instruments and have been corrected to the Kew standard; and the extracted observations have been carefully sifted in the course of extraction, and all doubtful entries rejected. Those which I shall now discuss are the barometric readings of ships north of latitude  $20^{\circ}$ , approaching and leaving the Sandheads; and are therefore all taken between distances of 60 and 120 miles from the coast. The observations having been made with marine mercurial barometers, it is probable that the amplitude of the range shewn by them may be somewhat less than would be shown by barometers with large tubes, were it practicable to use such instruments on board ship; but all the instruments issued by the Marine Meteorological Department (and such only have been employed) have been subjected to a preliminary

testing for sensitiveness and those only selected which have satisfied the test. It is therefore improbable that any large correction would be required to render the present data strictly comparable with those of a standard barometer.

The theory of diurnal land- and sea-breezes, as I understand it, is as follows. Under the morning sun, the air resting on a land-surface is more expanded than that resting on the sea; the larger part of the absorbed solar heat being used up, in the former case, in heating the air, while in the latter it is chiefly employed in evaporating water and charging the air with vapour; and, as I shewed in a former paper, the pressure of a given volume of air, when heated, is raised more than seven times as much as when the same amount of heat is consumed in charging it with vapour. The exact proportion at a temperature of  $80^{\circ}$  is 7.27. The expansion that follows in the two cases is not, however, quite in the same proportion, because more heat is consumed in work in the one case than in the other. Supposing that the expansion takes place under the same pressure in both cases, the ratios of expansion, for the same absorption of heat, would be 5.44 times as great in the case of the heated air as in that of the air charged with vapour, at the assumed temperature. The chief effect of this



unequal expansion is to tilt the planes of equal pressure (*de*, *fg*) somewhat as represented in the accompanying diagram, and to produce a *head of pressure* at a certain height in the atmosphere over the land; while at the land- and sea-surface the pressure is perhaps but little altered.

This process goes on as long as the temperature is rising; and the result is a current of air, at a certain height in the atmosphere, blowing from the land to the sea. But this transfer of air from the land- to the sea-atmosphere, while tending to restore equilibrium at the higher level, produces an increase of static pressure at the sea-surface, and reduces that at the land-surface; and therefore, a return current sets in at the lower level, which is the well known sea-breeze. As is well known, the sea-breeze sets in first on the coast-line; and as the day advances it extends in both directions, coming from further out at sea and penetrating to a greater distance inland. This continues till the equilibrium at the ground-surface is restored, which, however, does not occur until late in the evening. At Calcutta, the anemometer trace shews that, on an average, the retardation of the sea-breeze is such that it does not set in fairly until about 5 or 6 in the afternoon. Its prevalence, for some hours after this, is familiar to all residents in Calcutta in the cool southerly wind

which, in the hot weather, sets in about the hour of the evening drive, is at its height about the usual dinner-hour, and makes the south verandah so pleasant for the post-prandial lounge. It lulls gradually, and as a rule ceases to be felt about midnight. Meanwhile, the cooling of the lower and more heated strata of the air, by reducing their elasticity, allows the higher strata to sink under the influence of gravity; and this, the more rapidly, the faster the cooling proceeds; and since, in virtue of the momentum acquired during the interval of more rapid cooling, the motion continues, after the contraction has begun to relax, the lower strata are dynamically compressed, producing the evening maximum of barometric pressure. As the expansion in the morning is greatest over the land, so also is the contraction in the evening; and, owing to this, the isobaric planes at a certain elevation are again disturbed, sinking lower over the land and producing a head of pressure over the sea. This disturbance causes a transfer of air from over the sea to the land at the higher level; and is followed by an accumulation of pressure at the land-surface, causing the outflow of the land-wind in the early morning hours.

According to this theory, then, there should be an excess of pressure over the land in the morning and as long as the land-wind prevails, and an excess of pressure over the sea in the afternoon and evening; and we might expect that, at the time of the afternoon minimum, when, according to the theory of the barometric tides, the air is exercising simply a static pressure, the minimum of the sea-curve would shew a much less depression than the land-curve, while the reverse would hold good at the time of the morning minimum. A comparison of the Calcutta curve with that of the head of the Bay, superimposed in the accompanying diagram, shews that these relations really obtain in nature. Any small increase in the amplitude of the marine barometric curve which may be required to render it strictly comparable with that of the Calcutta standard barometer, would only have the effect of increasing the difference of the night maximum and minimum, and somewhat diminishing that of the morning maximum and afternoon minimum.

In the diagram, I have represented the curves as deviations from the same line of mean pressure. Actually, in January, the mean pressure of the land is in general lower than that over the sea. It must be remembered also that the places represented are 80 or 90 miles from the coast-line; and therefore quite on the limits of the belt within which the daily oscillation of the surface-winds is experienced. I anticipate that, when the data for March and April shall be brought into comparison in like manner, the two curves will shew a still greater difference, indicating a greater transfer of air.

The following are the values for the six hours of observation, deduced from the marine registers; the co-efficients of Bessel's formula, computed

therefrom ; and the hourly values calculated from the formula : in conjunction with which I give also the corresponding values for the Calcutta curve.



*Means of observations of Pressure. Sandheads. January.*

| Hour. | No. of obs. | Mean.  | Hour. | No. of obs. | Mean.  | Hour. | No. of obs. | Mean.  |
|-------|-------------|--------|-------|-------------|--------|-------|-------------|--------|
| Mid.  | 37          | 30·029 | 8     | 46          | 30·047 | 16    | 38          | 30·004 |
| 4     | 62          | 29·983 | Noon. | 64          | 30·042 | 20    | 50          | 30·027 |

*Bessel's formula. Sandheads. January.*

$$x = 30·022 + ·0068 \sin (n 15^\circ + 272^\circ 27') + ·0288 \sin (n 30^\circ + 152^\circ 3') + ·0093 \sin (n 45^\circ + 90^\circ).$$

*Computed values. Sandheads and Calcutta. January.*

| Hour. | Sandheads. | Calcutta. | Hour. | Sandheads. | Calcutta. |
|-------|------------|-----------|-------|------------|-----------|
| Mean  | 30·022     | 30·011    | Mean. | 30·022     | 30·011    |
| Mid.  | + ·016     | + ·003    | Noon. | + ·011     | + ·032    |
| 1     | — ·001     | — ·006    | 13    | — ·001     | — ·002    |
| 2     | — ·021     | — ·015    | 14    | — ·010     | — ·031    |
| 3     | — ·037     | — ·021    | 15    | — ·014     | — ·048    |
| 4     | — ·042     | — ·024    | 16    | — ·016     | — ·054    |
| 5     | — ·033     | — ·020    | 17    | — ·016     | — ·051    |
| 6     | — ·013     | — ·005    | 18    | — ·014     | — ·040    |
| 7     | + ·010     | + ·021    | 19    | — ·008     | + ·022    |
| 8     | + ·028     | + ·050    | 20    | + ·002     | + ·007    |
| 9     | + ·037     | + ·072    | 21    | + ·014     | + ·006    |
| 10    | + ·036     | + ·078    | 22    | + ·023     | + ·012    |
| 11    | + ·024     | + ·062    | 23    | + ·024     | + ·010    |

# JOURNAL

OF THE

## ASIATIC SOCIETY OF BENGAL.

### Part II.—PHYSICAL SCIENCE.

No. II.—1877.

#### VI.—Contributions towards a Knowledge of the Burmese Flora.

By S. KURZ.

(Continued from Vol. XLV, p. 310.)

#### *RHIZOPHOREÆ.*

##### *Conspectus of Genera.*

*Subord. I. RHIZOPHOREÆ.* Ovary inferior. Albumen none. Seeds germinating on the tree, the thick radicle rapidly enlarging and protruding from the summit of the fruit. Salt-loving shrubs or trees.

\* *Ovary-cells with 2—6 ovules.*

*RHIZOPHORA.* Calyx 4-cleft. Petals entire. Anthers 8—12, nearly sessile. Ovary 2-celled, the cells 2-ovuled.

*CERBERS.* Calyx 5—6-cleft. Petals notched, appendaged. Stamens 10—12. Ovary 3-celled, the cells 2-ovuled.

*KANDELIA.* Calyx 5—6-cleft. Petals cut. Stamens many, the filaments capillary. Ovary 1-celled, with 6 ovules.

\* \* *Ovary-cells with a solitary ovule.*

*BRUGUIERA.* Calyx 8—14-cleft. Petals 2-cleft, appendaged. Stamens 16—28, the filaments filiform. Ovary 2—4-celled.

*Subord. II. LEGNOTIDEÆ.* Ovary inferior, almost superior or free. Embryo imbedded in a fleshy albumen. Seeds germinating in the ordinary way.

\* *Ovary inferior. Calyx bell-shaped beyond the ovary.*

*CARALLIA.* Calyx-lobes short, erect. Stamens 10—16. Ovary-cells 2-ovuled. Flowers cymose.

*PELLACALYX.* Calyx-lobes short, recurved. Stamens 10—12. Ovary-cells many-ovuled. Flowers fascicled.

\* \* *Ovary superior or nearly so, with a broad base adnate to the calyx.*

*GYNOTRICHES.* Calyx without bractlets. Stamens 8—10, the filaments elongate. Ovary-cells 4-ovuled.

**Rhizophora, L.***Conspectus of Species.*

Flowers pedicelled, the petals villous along the borders; stamens 8, ... *R. mucronata*.  
 Flowers sessile, the petals quite glabrous; stamens 8—12, ..... *R. conjugata*.

1. *R. MUCRONATA*, Lamk. Enc. VI. 89; Wight Icon. t. 238; Miq. Fl. Ind. Bat. II. 584. (*Rhizophora Mangle*, Roxb. Fl. Ind. II. 459; *R. stylosa*, Griff. Not. Dicot. 665. t. 640; *Rh. macrorrhiza*, Griff. in Med. and Phys. Trans. Calc. VIII. 1836. 8 and Not. Dicot. 664).

HAB. Frequent in the mangrove-swamps of the shores from Arracan down to Tenasserim.—Fl. Fr. ∞.

2. *R. CONJUGATA*. L. sp. pl. 634; Miq. Fl. Ind. Bat. II. 584. (*R. Candelaria*, Griff. in Med. and Phys. Trans. Calc. VIII. 7).

HAB. Common in the mangrove swamps along the shores from Arracan down to Tenasserim and the Andamans.—Fl. Fr. ∞.

**Ceriops, Arn.***Conspectus of Species.*

Cymes compact, on very short peduncles; petals bristly fringed towards their tips,  
 .. *C. Roxburghiana*.

Cymes rather lax; petals terminated by 2 or 3 club-shaped appendages, *C. Candolleana*.

1. *C. ROXBURGHIANA*, Arn. in Ann. Nat. Hist. I. 362; Miq. Fl. Ind. Bat. II. 591. (*Rhizophora decandra*, Griff. Not. Dicot. 663; *Bruguiera decandra*, Griff. in Med. and Phys. Trans. Calc. VIII. 1838. 10).

HAB. Common in the littoral forests all along the shores from Chit-tagong down to Tenasserim and the Andamans.—Fl. HS.; Fr. CS.

2. *C. CANDOLLEANA*, Arn. in Ann. Nat. Hist. I. 364; Wight Icon. t. 240; Miq. Fl. Ind. Bat. II. 590.

HAB. Frequent in the mangrove swamps of the Andamans.—Fl. HS.; Fr. CS.

**Kandelia, W. A.**

1. *K. RHEEDEI*, WA. Prod. I. 34; Wight Ill. I. 209. t. 89; Miq. Fl. Ind. Bat. II. 585.

HAB. Frequent in the littoral forests, especially the tidal ones, at the debouchures of the larger rivers of Pegu and Tenasserim.—Fl. HS.; Fr. RS.

**Bruguiera, Lamk.***Conspectus of Species.*

Subg. I. *Kanilia*, Bl. Calyx-tube almost club-shaped, the limb 8-cleft. Petals 8, bearing bristles at the tips. Stamens 16, the filaments filiform and longer than the cordate or ovate anthers. Fruit cylindrical.

Calyx-tube narrowed at base, ribbed, the lobes very short and stiff, ... *B. parviflora*.  
 Calyx-tube obtuse at the base, smooth, the lobes nearly as long as the tube, ... *B. coryophylloides*.

*Subg. II. Mangium*, Bl. Calyx-tube almost bell-shaped, the limb 10—14-cleft. Petals 10—14. Stamens 20—28, the anthers linear, longer than the filaments. Ovary 3—4-celled. Fruit turbinate. .... *B. gymnorhiza*.

1. *B. PARVIFLORA*, WA. Prod. I. 311; Miq. Fl. Ind. Bat. II. 589; Griff. in Med. and Phys. Trans. Calc. VIII. 10. (*Rhizophora parviflora*, Roxb. Fl. Ind. II. 461).

HAB. In the littoral forests of Tenasserim and the Andamans. (Hb. 2207).—Fl. CS.

2. *B. CARYOPHYLLOIDES*, Bl. Enum. I. 93; Miq. Fl. Ind. Bat. II. 589. (*Rhizophora caryophylloides*, Griff. Not. Dicot. t. 624).

HAB. In the mangrove swamps at the debouchure of the Salween in Upper Tenasserim.—Fl. Febr.; Fr. Apr.

3. *B. GYMORHIZA*, Lamk. Enc. Bot. IV. 696; Miq. Fl. Ind. Bot. II. 586; Griff. in Med. and Phys. Trans. Calc. VIII. 10. (*B. Wightii*, Bl. Mus. Bot. 138; Miq. Fl. Ind. Bat. II. 587; *B. Rheedei*, Bl. Enum. I. 92; Miq. l. c.; Wight Icon. t. 239. A.; *B. parietosa*, Griff. Not. Dicot. 670. t. 641; *B. 10-angulata*, Griff. Not. Dicot. 669; *B. eriopetala*, Wight III. I. 10 and Icon. t. 239).

HAB. Common in the littoral forests all along the coasts from Chit-tagong down to Tenasserim and the Andamans.—Fl. Jan.—May.

I know only of one species of this alliance, flowering while still a shrub and becoming a tree of 80 ft. in height in favourable situations. The indument of the petals and the number or absence of bristles appear to me fallacious characters.

#### *Carallia*, Roxb.

##### *Conspectus of Species.*

Leaves usually entire; petals not embracing the filaments, ..... *C. lucida*.

Leaves serrulate; petals embracing the filaments, ..... *C. lanceafolia*.

1. *C. LUCIDA*, Roxb. Corom. Pl. III. 211 and Fl. Ind. II. 481; Griff. in Med. and Phys. Trans. Calc. VIII. 11; WA. Prod. I. 312; Wight Icon. t. 605.—(*C. integerrima*, DC. Prod. III. 33; Bth. in Linn. Proc. III. 74; Bedd. Fl. Sylv. t. 193; *C. zeylanica*, Arn. in Wight Illustr. t. 90).

HAB. Frequent in the tropical and moister upper mixed forests, ascending into the hill-forests up to 4000 ft. elevation, rare in the low forests, all over Pegu, Martaban, and Tenasserim.—Fl. C. S.; Fr. HS.

2. *C. LANCEAFOLIA*, Roxb. Fl. Ind. II. 481; Wight Icon. t. 604; Bth. in Linn. Proceed. III. 75.—(*C. confinis*, Bl. Mus. Lugd. Bat. I. 129).

HAB. In the tropical forests of Tenasserim.

#### *Gynotroches*, Bl.

1. *G. AXILLARIS*, Bl. Mus. Lugd. Bat. I. 127. t. 31; Bth. in Linn. Proc. III. 76.

HAB. Upper Tenasserim, Moulmein (Lobb.).

## COMBRETACEÆ.

## Conspectus of Genera.

**Subord. I. COMBRETÆÆ.** Calyx-lobes valvato. Stamens without alternating glands at the base, the filaments often inflexed in bud; anthers versatile, opening in longitudinal slits. Ovary with 2 to 12 suspended ovules. Flowers in racemes, spikes, or heads.

\* *Calyx-limb deciduous.*

× Calyx-tube short, constricted but not produced beyond the ovary.

**TERMINALIA.**—Petals none. Stamens inflexed in bud, exserted. Flowers spiked or panicle. Erect trees.

**COMBRETUM.** Petals very rarely wanting. Stamens straight in bud. Flowers usually racemose or panicle. Usually scandent shrubs.

× × Calyx-tube elongate and produced beyond the ovary.

**ANOGEISSUS.** Calyx-tube 2-winged at the base. Stamens 10, exserted. Leaves alternate. Flowers in heads, small.

**QUISQUALIS.** Calyx-tube very long and slender, the limb small. Stamens 10, exserted. Leaves opposite. Flowers showy, in racemes.

\* \* *Calyx-limb persistent.*

**CALYCOTERNIS.** Calyx-tube 5-ribbed, not produced beyond the ovary, the limb enlarging. Stamens 10, included. Leaves opposite. Flowers racemose. Climbers.

**LUMNITZERA.** Calyx-tube elongate, narrowed beyond the ovary. Stamens 5 or 10, exserted. Leaves alternate. Flowers racemose. Trees or erect shrubs.

**Subord. II. GYROCARPÆÆ.** Calyx-lobes valvate or imbricate. Stamens alternating with as many glands or staminodes; filaments straight in bud; anthers adnate, opening by a slit along the inner edge or in 2 valves. Ovary with a solitary pendulous ovule. Leaves alternate. Flowers cymose.

**ILLIGERA.** Calyx-lobes valvate, deciduous. Fruit extended into 2 or 4 lateral wings. Climbers with 3-foliate leaves.

**GYROCARPUS.** Calyx-lobes imbricate, 2 of them persistent and enlarging wing-like. Nut 2-winged at the top. Erect trees with entire or lobed leaves.

## Terminalia, I.

## Conspectus of Species.

**Subg. I. Myrobalanus, Gærtn.** Fruit a fleshy drupe, compressed or absolutely angular, the putamen bony.

\* *Spikes simple, solitary in the leaf-axils.*

O Spikes, quite glabrous.

Glabrous or pubescent; petioles very short, the base of the broad leaves more or less rounded; drupes  $1\frac{1}{2}$ —2 in. long, compressed, ..... *T. catappa.*

As preceding but glabrous, the base of the leaves more or less acuminate; drupes about an in. long, obsoletely 5-angular, ovoid-oblong, red inside, ..... *T. procera.*

O O Spikes puberulous or tomentose.

Leaf-buds rusty villous; leaves obovate, on 2—3 in. long petioles, usually silky pubescent; drupes obovoid, silky puberulous, ..... *T. Delerica.*

\* \* *Spikes more or less panicle at the end of the branchlets, puberulous or tomentose.*

Young shoots and underside of the oblong leaves rusty villous, the petiole short; ovary villous; drupes oval, glabrous, ..... *T. chebula*.

As preceding, but ovary quite glabrous, the flowers and fruits much smaller, the leaves more coppery villous beneath, ..... *T. tomentella*.

Very young shoots rusty villous; leaves smooth and glabrous, acuminate, the petiole short; drupes oblong-lanceolate, obsolete 5-cornered, glabrous, ..... *T. citrina*.

*Subg. II. Pentaptera*, Roxb. Fruit a dry nut, with a chartaceous or fibro-coriaceous pericarp, compressed or 3—5-cornered with as many equal or unequal wings, or only with 2 or a single wing all round.

\* Nuts usually 3-cornered, the angles expanded into 2 equal, or 3—1 unequal wings. (Chuncoa, Pav.)

× Nuts large, equally 2-winged,  $1\frac{1}{2}$ —2 in. long. Spikes simple, axillary.

All parts glabrous; spikes puberulous or tomentose; leaves obovate, the petiole 2—3 in. long; nut 3-cornered, with 2 large equal spreading wings, about 3— $3\frac{1}{2}$  in. across,

*T. bialata*.

As preceding, leaves smaller and shorter petioled; nuts equally 2-winged, only  $\frac{1}{2}$ — $\frac{3}{4}$  in. across, ..... *P. pyrifolia*.

× × Nuts small, unequally 2—3-winged. Spikes forming terminal panicles.

Fruits unequally 3-winged, puberulous, brown, ..... *T. paniculata*.

Fruits much smaller than in preceding, equally 2-winged, almost glabrous, pale coloured, ..... *T. myriocarpa*.

\* \* Nuts 4- or 5-cornered, all the angles expanded into equal wings.

All parts more or less greyish tomentose; leaves strongly net-veined beneath, the petiole short, furnished with 2 stalked turbinate glands, ..... *T. alata*.

All parts glabrous; leaves not prominently net-veined beneath, the petiole short, with 2 stalked turbinate glands; spikes paniced, like the calyxes, puberulous or almost tomentose, ..... *T. crenulata*.

As preceding, but the paniced spikes and outside of calyx quite glabrous, .. *T. macrocarpa*.

1. *T. CATAPPA*, Linn. Mant. 519; DC. Prod. III. 11.; WA. Prod. 12.; Roxb. Fl. Ind. II. 430; Bot. Mag. t. 3004; Wight Icon. t. 172; Bedd. Fl. Sylv. t. 20 (*T. Moluccana*, Lamk. Diet. I. 349; DC. l. c., non Roxb.).

HAB. Frequent in the beach-forests of the Andaman islands, probably also in Tenasserim; much cultivated in villages all over the country.—Fl. May, June; Fr. Apr.

2. *T. PROCERA*, Roxb. Corom. Pl. III. t. 244 and Fl. Ind. II. 429; DC. Prod. III. 12.

HAB. Frequent in the tropical forests of the Andaman islands.

In Andaman Rep. p. 37, I stated that this species hardly differs from the preceding. This is a mistake. The Nicobar species of *Terminalia* which I presumed to be new (Journ. As Soc. Beng. 1876, 130) belongs here.

3. *T. BELERICA*, Roxb. Corom. Pl. II. t. 198 and Fl. Ind. II. 431; DC. Prod. III. 12; WA. Prod. I. 313; Wight Ill. I. t. 91.; Miq. Fl. Ind. Bat. I/1. 600; Bedd. Fl. Sylv. t. 19. (*Myrobalanus belerica*, Gaertn. Fruct.

II. 90. t. 97; Rheed. Hort. Malab. IV. t. 10; *T. fetidissima*, Griff. Not. Dicot. 685; *T. laurinoïdes*, T. and B. in Miq. Fl. Ind. Bat. I/1. 600).

HAB. Frequent in the mixed forests up to 2000 ft. elevation, all over Burma and the adjacent provinces.—Fl. Apr. May; Fr. CS.

4. *T. CHEBULA*, Retz. Obs. V. 31; Roxb. Corom. Pl. II. t. 197 and Fl. Ind. II. 435; DC. Prod. III. 13; WA. Prod. I. 313; Miq. Fl. Ind. Bat. I/1. 601; Brand. For. Fl. t. 29; Bedd. Fl. Sylv. t. 27. (*T. reticulata*, Roth. Nov. sp. 381; DC. l. c.).

HAB. Chittagong.

5. *T. TOMENTELLA*, Kurz in Journ. As. Soc. Beng. 1873. 80.

HAB. Frequent in the upper mixed and the low forests, all over Pegu and Martaban down to Tenasserim.—Fl. June; Fr. CS.

6. *T. CITRINA*, Roxb. Fl. Ind. II. 435; DC. Prod. III. 12; Miq. Fl. Ind. Bat. I/1. 602. (*Myrobalanus citrina*, Gärtn. Fruct. II. 91. t. 97).

HAB. Not unfrequent in the tropical forests of the Andamans; Tenasserim (Helf. 2178).—Fr. CS.

7. *T. BIALATA*, Wall. ap. Voigt. Cat. Suburb. Calc. 36 (*Pentaptera bialata*, Roxb. Fl. Ind. II. 440; DC. Prod. III. 15).

HAB. Not uncommon in the upper mixed forests of the Andamans.—Fl. RS.

8. *T. PYRIFOLIA*, (*Pentaptera pyrifolia*, Presl. Epim. Bot. 214; Walp. Ann. III. 859; *T. Javanica*, Miq. Fl. Ind. Bat. I/1. 602 ?)

HAB. Frequent in the mixed forests, especially the upper ones, all over Pegu and Martaban down to Tenasserim.—Fl. HS.; Fr. CS.

9. *T. MYRIOCARPA*, v. Heurck and Muell. Arg. Obs. Bot. 215.

HAB. Ava, Khakyeu hills east of Bhamo (J. Anderson).—Fr. March.

10. *T. ALATA*, Roth. Nov. sp. 379; Miq. Fl. Ind. Bat. I/1. 602. (*Pentaptera tomentosa*, Roxb. Fl. Ind. II. 440; DC. Prod. III. 14; *T. tomentosa*, WA. Prod. I. 314; Wight Leon. t. 195; Bedd. Fl. Sylv. t. 17; *T. elliptica*, Willd. sp. pl. IV. 969 ?).

HAB. Frequent in the lower mixed and the open forests, all over Pegu and Martaban.—Fl. HS.; Fr. CS.

11. *T. CRENULATA*, Roth. Nov. sp. 380; Miq. Fl. Ind. Bat. I/1. 603. (*Pentaptera glabra*, Roxb. Fl. Ind. II. 440; *T. glabra*, WA. Prod. I. 314; *Pentaptera obovata* and *P. crenulata*, DC. Prod. III. 14 and 15).

HAB. Not unfrequent in the upper mixed forests of the Pegu Yomah and Arracan.—Fr. CS.

12. *T. MACROCARPA*, (*Pentaptera macrocarpa*, Wall. Cat. 3982).

HAB. Frequent in the upper-mixed and the open forests, all over Pegu and Martaban down to Upper Tenasserim.—Fl. H. S.; Fr. CS.

## Doubtful Species.

1. *Pentaptera gracilis*, Presl. Epim. 214; Walp. Ann. III. 859.

HAB. Upper Tenasserim, near Moulmein.

The leaves are described as whorled by threes, indicating a species of *Combretum* rather than of *Terminalia*.

*Combretum*, L.*Conspectus of Species.*

*Subg. I. Poierea*, Comm. Flowers 5-merous. Stamens 10, all equal or alternately shorter. Fruits usually 5-, rarely 4- or 6- or 8-cornered or -winged.

\* *Calyx funnel-cup-shaped.*

× Petals none.

Leaves only  $1\frac{1}{2}$ —3 in. long; panicles greyish velvety, the floral leaves not discoloured,  
.. *C. apetalum*.

× × Petals present.

Leaves large, opposite; panicles rusty or tawny tomentose, the floral leaves white-discoloured; fruits with 5 chartaceous wings, ..... *C. decandrum*.

Leaves often whorled by 2—4, smooth, coriaceous; panicles greyish tomentose without floral leaves; fruits with 5 sharp thick almost wing-like corners, .... *C. trifoliatum*.

Similar to the preceding, but leaves strongly nerved and not-veined; fruits sharply 4-cornered, ..... *C. tetragonocarpum*.

\* \* *Calyx-tube tubular, the limb abruptly suber- or cup-shaped.*

Racemes, petioles, and branchlets greyish or rusty puberulous or velvety, .... *C. ovale*.

Panicles, petioles, and branchlets all rusty pilose; fruits 5-winged, puberulous,

.. *C. pilosum*.

*Subg. II. Combretum*, DC. Flowers 4-merous. Stamens 8, equal or alternately shorter. Fruits usually 4-, rarely 5-winged or -cornered.

\* *Calyx shorter or longer tubular-bell-shaped (the limb never abruptly cupular).*

Fruits winged, the wings chartaceous and broader than the diameter of the nut.

× Flowers shortly pedicelled.

All parts glabrous, the leaves opposite; inflorescence and flowers velvety, *C. extensum*.

× × Flowers all sessile.

All younger parts, the inflorescence, and leaves beneath coppery or rusty lepidote;

leaves large, opposite, ..... *C. squamosum*.

Leaves usually whorled in threes (at least in the older branchlets), glabrous, when young minutely lepidote; inflorescence and young shoots puberulous, ..... *C. chinense*.

As preceding, but branchlets, petioles, and inflorescence all rusty tomentose; leaves more or less pubescent beneath, never lepidote, ..... *C. dasystachyum*.

\* \* *Calyx funnel-cup-shaped. Fruits winged or angular.*

× Fruits 4- or 5-winged, the wings chartaceous. Leaves and fruits small.

† Nuts smooth and glabrous.

Young shoots rusty pubescent, the leaves and the 4- or 5-winged fruits glabrous;

branchlets terete, ..... *C. pyriformum*.

All parts, also the 4-winged fruits, more or less silvery lepidote; branchlets 4-cornered.

.. *C. quadrangulare*.

† † Nuts fibrillose-hirsute.

Leaves beneath resinose-dotted; inflorescence brown-lepidote; young shoots pubescent,

.. *C. Wallichii*.

× × Fruits 4-cornered, the angles thick and rounded.

Inflorescence and young branchlets rusty puberous, the former also lepidote; leaves large, strongly nerved, and parallel-veined, ..... *C. costatum*.

1. *C. APETALUM*, Wall. Cat. 3990.

HAB. Common in the dry forests of the Prome District; Ava, along the Irrawaddi from Segain southwards.—Fl. Sept.—Jan.; Fr. March.

2. *C. DECANDRUM*, Roxb. Corom. Pl. I. t. 59 and Fl. Ind. II. 232, non Jacq.; G. Don. in Linn. Trans. XV. 437 (*Poivreia Roxburghii*, DC. Prod. III. 18; WA. Prod. I. 317).

HAB. Common in all forests, especially the tropical ones, up to 3000 ft. elevation, all over Burma and adjoining provinces.—Fl. Nov.—Febr.

3. *C. TRIFOLIATUM*, Vent. Choix d. pl. 58. t. 58; Miq. Fl. Ind. Bat. I/1. 610; G. Don. in Linn. Trans. XV. 439. (*Terminalia lancifolia*, Griff. Not. Dicot. 685. t. 644. f. 4; *Embryogonia lucida*, Bl. Mus. Lugd. Bat. II. t. 52).

HAB. Frequent in the swamp-forests of the alluvial lands all over Burma, from Ava down to Tenasserim.—Fl. Jan.—March; Fr. Apr. June.

4. *C. TETRAGONOCARPUM*, Kurz in Journ. As. Soc. Beng. 1872. 306.

HAB. Frequent in the swamp-forests of the alluvial lands of Pegu.—Fl. Febr. March; Fr. May, June.

5. *C. OVALE*, R. Br. in App. to Salt's Trav. in Abyss.; G. Don. in Linn. Trans. XV. 434.

HAB. Not unfrequent in the tropical and mixed forests of the Pegu Yomah; also in shrubbery etc. of Martaban east of Tounghoo.—Fl. March to May.

Possibly only a variety of the following species.

6. *C. PILOSUM*, Roxb. Fl. Ind. II. 231; G. Don in Linn. Trans. XV. 434.—(*Poivreia pilosa*, WA. Prod. I. 317 in adn.; *C. sp.* Griff. Not. Dicot. 683?).

HAB. Pegu, Rangoon (Cleghorn); Tenasserim, from Moulmein (Falconer) to Mergui (Griff.); Ava, Kakhien hills (J. Anderson).—Fl. Jan.

7. *C. EXTENSUM*, Roxb. Hort. Beng. 28 and Fl. Ind. II. 229; G. Don. in Linn. Trans. XV. 422?; Miq. Fl. Ind. Bat. I/1. 608. (*C. rotundifolium*, Roxb. Fl. Ind. II. 39, non Rich.; *C. Horsfieldii*, Miq. Fl. Ind. Bat. I/1. 609; *C. platyphyllum*, Heurck and Muell. Arg. Obs. bot. 1871. 243; *C. formosum*, Griff. Not. Dicot. 682).

HAB. Frequent in all leaf-shedding forests, especially along the larger rivers, all over Burma and the adjoining provinces.—Fl. Jan.—March; Fr. May.

8. *C. SQUAMOSUM*, Roxb. Fl. Ind. II. 231; Miq. Fl. Ind. Bat. I/1. 607; G. Don in Linn. Trans. XV. 438. (*C. lepidotum*, Presl Bot. Bemerk. 112; Walp. Ann. I. 290).

HAB. Frequent in the lower mixed and the open forests, especially the low ones, all over Pegu and from Martaban down to Tenasserim.—Fl. March, Apr. and Nov. ; Fr. CS. and May, June.

A variety, or rather sport, from Prome (J. Anderson) with abnormal much bracted inflorescences, has all the scales developed into yellowish hairs, so as to appear hirsute all over. *C. punctatum*, Bl., differs not only by the very short obovate petals, but also in the inflorescence, shape of leaves, and the smaller fruits.

9. *C. CHINENSE*, Roxb. Fl. Ind. II. 230 ; G. Don. in Linn. Trans. XV. 432 ? (*C. ternatum*, Wall. Cat. 4002 ; *C. Griffithii*, Heurck and Muell. Arg. Obs. bot. 231).

HAB. Not unfrequent in the tropical forests of the Martaban hills, east of Tounghoo, up 3000 ft. elevation ; Chittagong.—Fr. March, Apr.

Don's *C. Chinense* is unknown to me and may possibly be the same as *C. squamosum*, Roxb., but the petals are apparently different.

10. *C. DASYSTACHYUM*, Kurz in Journ. As. Soc. Beng. 1874. 187.

HAB. Not unfrequent in the tropical forests, especially along choungs, along the eastern slopes of the Pegu Yomah and of Martaban.—Fl. March, Apr.

11. *C. PYRIFOLIUM*, Kurz in Journ. As. Soc. Beng. 1874. 188 (*Pentoptera pyrifolia*, Wall. Cat. 3985, non Presl).

HAB. Ava, on Taung-dong (Wall.) ; near Mandalay (J. Anderson).—Fr. Sept.—Nov.

12. *C. QUADRANGULARE*, Kurz in Journ. As. Soc. Beng. 1874. 188.

HAB. Tenasserim (Helf. 2181).—Fl. Apr., May.

Judging from the description only, I do not think that this species may be compared with *C. stelligerum* of Presl.

13. *C. WALLICHII*, DC. Prod. III. 21.

HAB. Tropical forests of Chittagong ; Ava, Khakyen hills.—Fl. RS. ; Fr. CS.

14. *C. COSTATUM*, Roxb. Fl. Ind. II. 227.

HAB. Martaban to Tenasserim (Falconer, Brandis).—Fr. HS.

### *Doubtful Species.*

*C. stelligerum*, Presl. Epim. 215 ; Walp. Ann. III. 860.

HAB. Tenasserim, near Moulmein (Helf.).

### *Anogeissus*, Wall.

### *Conspectus of Species.*

• • • • • *Brak as long as or longer than the nut.*

Leaves oval to ovate-lanceolate, retuse or blunt, glabrous ; flower-heads several together on a branched peduncle, . . . . . *A. latifolia*.

Leaves acuminate, pubescent at least when young; flower-heads solitary on a simple peduncle,  $\frac{1}{2}$ — $\frac{3}{4}$  in. across, ..... *A. acuminata*.

\* \* Beak shorter than the nut.

Leaves obovate; flower-heads  $\frac{1}{4}$  in. across, solitary on a simple peduncle, .. *A. pendula*.

1. *A. ACUMINATA*, Wall. Cat. 4014; Walp. Rep. II. 63; Bedd. Fl. Sylv. t. 16. (*Conocarpus acuminatus*, Roxb. Fl. Ind. II. 443; DC. Prod. III. 17; WA. Prod. I. 316; DC. in Mém. d. Génèv. IV. 35. t. 3).

Var. *a. GENUINA*, ovary and style villous; fruits and the beak more or less pubescent.

Var. *β. PHILLYREÆFOLIA*, (*A. phillyreæfolia*, Heurck and Muell. Arg. Obs. Bot. 209), ovary and style minutely appressed-pubescent; fruits and beak glabrous or nearly so.

HAB. Var. *a.* frequent in the mixed (especially the upper ones) and also in tropical forests, from Chittagong and Martaban down to Tenasserim, up to 3000 ft. elevation; var. *β.* restricted to the alluvial plains of Ava, Prome, and Pegu, chiefly in the swamp-forests.—Fl. Febr., March; Fr. Apr., May.

This tree is remarkable by the bark, which consists of herbaceous green tubercles covered with a smooth grey epidermis which is easily scraped off. By this mark the tree can be recognised from all others in Burma, but in the plains (the var. *β.*) the bark becomes white marmorate and conchoid (as in *Emblica officinalis*). I should certainly have specifically separated this swamp variety had I not met with trees that bore both kinds of bark.

### Quisqualis, L.

1. *Q. INDICA*, L. sp. pl. 556; Bot. Mag. t. 2033; Bot. Reg. t. 452; DC. Prod. III. 23; Roxb. Fl. Ind. II. 427; Wight Illustr. f. t. 92; Miq. Fl. Ind. Bat. I/1. 610; Griff. Not. Dicot. 683 (*Q. longiflora*, Presl. Epim. 216; Walp. Ann. II. 860).

Var. *a. GENUINA*, bracts leafy, from ovate and lanceolate to linear-lanceolate; petals oblong or elliptically oblong, blunt or nearly so.

Var. *β. VILLOSA*, (*Q. villosa*, Roxb. Fl. Ind. II. 426; DC. Prod. III. 23), bracts subulate to linear, small and inconspicuous; petals usually obovate and often almost notched.

Var. *γ. OXYPETALA*, as preceding, but the petals broadly lanceolate and acute or nearly so.

HAB. Not unfrequent in the tropical and lower mixed forests from Ava and Pegu down to Tenasserim; var. *γ.* Ava, Khakyen hills, east of Bhamo (J. Anderson).—Fl. March to May.

**Calycopteris, Lamk.***Conspectus of Species.*

Leaves pubescent, rarely almost glabrous; longer stamens  $\frac{1}{2}$ — $\frac{3}{4}$  as long as the acute calyx-lobes, ..... *C. nutans*.

Leaves glabrous; longer stamens as long as the long bluntish calyx-lobes, *C. floribunda*.

1. *C. NUTANS*. (*Getonia nutans*, Roxb. Fl. Ind. II. 428; DC. Prod. III. 15; *Getonia floribunda*, WA. Prod. I. 315, non Roxb.).

Var. *a.* ROXBURGHII, leaves ovate-oblong to ovate-lanceolate, the larger ones 5—6 in. long, firmly chartaceous, more or less rusty or tawny pubescent beneath.

Var. *β.* GLABRIUSCULA, the larger leaves 3—4 in. long, oblong to ovate-oblong, thin chartaceous, nearly glabrous.

HAB. Frequent in the mixed forests, shrubbery, along bushy riversides, &c., also in the savannahs, from the plains up to 2,000 ft. elevation and higher; all over Prome, Pegu and Martaban down to Tenasserim.—Fl. Jan.—March; Fr. Febr.—May.

Wight and Arnott state that *C. nutans* with short stamens does not occur in Hindustan, but all the specimens which I have seen from there belong to *C. nutans*, none to *C. floribunda*, Lamk. (*Getonia nutans*, Roxb. Corom. Pl. I. 61. t. 87?).

**Lumnitzera, Willd.***Conspectus of Species.*

Flowers white; stamens 10, about as long as the petals, ..... *L. racemosa*.

Flowers crimson; stamens 5—10, twice as long as the petals, ..... *L. littorea*.

1. *L. RACEMOSA*, Willd. Nov. Act. Nat. Cur. Berol. IV. 186; DC. Prod. III. 22; WA. Prod. I. 316; Miq. Fl. Ind. Bat. I/1. 606. (*Petalotoma alternifolia*, Roxb. Fl. Ind. II. 372; Rheed. Hort. Malab. VI. t. 37).

HAB. Frequent along tidal channels, &c., of the beach-forests, also in the tidal forests, all along the coasts from Arracan down to Tenasserim and the Andamans.—Fl. HS.

2. *L. LITTOREA*, Voigt Cat. Hort. Calc. 39. (*Pyrranthus littoreus*, Jack Mal. Misc. II. 57; *L. coccinea*, WA. Prod. I. 316; Miq. Fl. Ind. Bat. I/1. 606; *L. pentandra*, Griff. Not. Dicot. 684).

HAB. Tenasserim, in the mangrove jungles of Mergui (Griff.).—Fl. Fr. Sept.

**Illigera, Bl.**

1. *I. APPENDICULATA*, Bl. Bydr. 1153; Miq. Fl. Ind. Bat. I/1. 1094; DC. Prod. XV/1. 251. (*I. Coryzadenia*, Meisn. in DC. Prod. XV/1. 251; *Coryzadenia trifoliata*, Griff. Not. Dicot. 356?).

**HAB.** Frequent in the tropical forests of the Pegu Yomah and from Martaban down to Tenasserim and the Andamans.—Fl. Octob. ; Fr. March, Apr.

**Gyrocarpus**, Jacq.

1. *G. AMERICANUS*, Jacq. Amer. 282. t. 178. f. 80 ; DC. Prod. XV/1. 247. (*G. Jacquini*, Roxb. Corom. Pl. I. 2. t. 1 and Fl. Ind. I. 445 ; Bth. Fl. Austr. II. 506 ; Bedd. Fl. Sylv. t. 196 ; *G. Asiaticus*, Willd. sp. pl. IV. 982 ; DC. l. c. ; *G. acuminatus*, Meisn. in DC. l. c. ; *G. sphenopterus* and *G. rugosus*, R. Br. Prod. Nov. Holl. 405 ; DC. l. c.).

**HAB.** Not unfrequent in the coast-forests of the Andamans and Tenasserim.—Fl. RS. ; Fr. CS.

**MYRTACEÆ.**

*Conspectus of Genera.*

**Trib. I. LEPTOSPERMEÆ.** Ovary 2—5- rarely more-celled. Fruit a capsule, either opening at the summit in as many valves as there are cells, or very rarely indehiscent.

\* *Stamens in a single row, free.*

**BECKEA.** Stamens usually fewer than 20. Flowers small. Leaves opposite, narrow.

**LEPTOSPERMUM.** Stamens numerous, in a continuous row. Flowers solitary or crowded. Leaves alternating.

\* \* *Stamens united into 5 separate bundles.*

**MELALEUCA.** Staminal bundles alternating with the petals. Flowers in heads or spikes. Leaves alternating.

**TRISTANIA.** Staminal bundles opposite the petals. Flowers in cymes or corymbs. Leaves broad, alternate, rarely opposite.

**Trib. II. MYRTEÆ.** Ovary 2- or more-celled. Fruit an indehiscent berry or drupe very rarely opening by an apical opercle.

**Subtr. I. EU-MYRTEÆ.** Leaves opposite, dotted.

Stigma peltate or capitate. Testa of seeds hard. Cotyledons small.

+ Ovules 2—6 in each cell.

**DECASPERMUM.** Ovary 5- or rarely 4-celled. Embryo long and narrow, curved, circular or spiral.

+ + Ovules numerous, in 2 or more series.

**RHODAMNIA.** Ovary 1-celled, with 2 parietal placentas. Leaves 3-nerved.

**RHODOMYRTUM.** Ovary 1-, 2-, or 3-celled, with 2 rows of superposed ovules in each cell and the ovules separated by transverse septa. Leaves sometimes 3-nerved.

**PSIDIUM.** Ovary 2—7 (usually 4—5)-celled, the placentas often 2-lamellate. Leaves penni-nerved.

x x Stigma simple, minute. Testa of seed membranous.

**EUGENIA.** Ovary 2—3-celled, with several ovules in each cell. Embryo thick and fleshy, either indivisible or with 2 thick fleshy cotyledons, the radicle short. Flowers 4- rarely 5-merous, solitary or in cymes or panicles. Leaves penni-nerved.

**Subtr. II. LECYTHIDEÆ.** Leaves alternate, not dotted. Calyx nearly valvate, rarely imbricate.

**BARRINGTONIA.** Stamens all perfect. Ovary 2- or 4-celled, with numerous ovules in each cell. Fruit fibrous or fleshy, often angular, 1- or very rarely 2—4-seeded.

**CAREYA.** Outer or inner series, or both, without anthers. Fruit globose to ovoid, many-seeded, the seeds imbedded in pulp. Ovary 4-celled.

### **Melaleuca, L.**

1. **M. LEUCADENDRON**, L. Mant. 105: DC. Prod. III. 212; Roxb. Fl. Ind. III. 397; Bth. Fl. Austr. III. 142. (*M. Cajaputi*, Roxb. Fl. Ind. III. 394; *M. minor*, Sm. in Rees Cycl. V. 23. No. 2; DC. Prod. III. 212).

HAB. Tenasserim, Mergui, rare (Griff.).

### **Tristania, R. Br.**

#### *Conspetus of Species.*

\* *Calyx-lobes blunt or almost so.*

Leaves sessile or nearly so, rigidly coriaceous, glossy on both sides; flowers sessile or nearly so; calyx about 3 lin. across, ..... *T. Merguensis*.

Leaves petioled, thin coriaceous, opaque beneath; flowers pedicelled; calyx only 1½ lin. across; capsule exserted, ..... *T. Burmanica*.

\* \* *Calyx-lobes subulate-acuminate.*

Leaves crowded, narrowed at both ends; flowers rather large; capsule hardly exserted, .. *T. Griffithii*.

1. **T. MERGUENSIS**, Griff. in Journ. As. Soc. Beng. 1854. 637 (*T. affinis*, Griff. Not. Dicot. 650. t. 636. f. 3).

HAB. Tenasserim, Mergui, along the coast (Griff. and Helf. 2341). —Fl. Aug.

2. **T. BURMANICA**, Griff. in Journ. As. Soc. Beng. 1854. 637.—(*T. sp.* Griff. Not. Dicot. 648 ?)

HAB. Not unfrequent in the eng- and hill-eng-forests, from Martaban down to Tenasserim, also ascending into the drier hill-forests up to 4000 ft. elevation; according to Dr. Brandis also in the Pegu Yomah. —Fl. March, Apr.; Fr. Apr., May.

3. **T. GRIFFITHII**, (*T. conferta*, Griff. Not. Dicot. 649, viz R. Br.).

HAB. Tenasserim, Mergui (Griff.).—Fl. Fr. Jan.

### **Decaspermum, Forst.**

1. **D. PANICULATUM**, (*Nelitris paniculata*, Ldl. Collect. sub No. 16; DC. Prod. III. 231; Wight Icon. t. 521; *Eugenia polygama*, Roxb. Fl. Ind. II. 491; *N. polygama*, Bl. Mus. Lugd. Bat. I. 75; Miq. Fl. Ind. Bat. I. 474; *N. pallescens*, Miq. Suppl. Fl. Sumatr. 314).

Var. **a. GENUINA**, pedicels longer, calyx-lobes 5, more equal and usually somewhat acute; flowers in simple rarely branched racemes.

Var. **β. THYRSOLDEA**, (*N. paniculata*, Wall. Cat. 3627), pedicels shorter, sometimes very short; calyx-lobes 4, usually unequal, more or less rounded; flowers somewhat smaller, often in thyrsoid racemes.

HAB. Var. *a.* very frequent in the drier hill-forests of Martaban and Tenasserim, freely springing up in toungyas, at 3000 to 4000 ft. elevation.—Fl. March.

### **Rhodamnia, Jack.**

1. *R. TRINERVIA*, Bl. Mus. Lugd. Bat. I. 79; Bth. Fl. Austr. III. 278. (*Myrtus trinervia*, Sm. in Linn. Trans. III. 280; *Eugenia? trinervia*, DC. Prod. III. 279; Bot. Mag. t. 3223).

Var. *a. CONCOLOR*, (*Rhodamnia cinerea*, Griff. Not. Dicot. 653, non Jack; *R. concolor*, Miq. Suppl. Fl. Sumatr. 315; *R. trinervia*, Bl. l. c.), leaves green on both sides, beneath thinly and minutely puberulous or almost glabrescent; flowers usually by 4—7, but also fewer or solitary.

Var. *β. SPECTABILIS* (*R. spectabilis*, Bl. Mus. Bot. Lugd. Bat. I. 78; Miq. l. c. 479; *R. cinerea*, Jack Mal. Misc. II. 48; *Monoxora spectabilis*, Wight Icon. t. 524; *R. Nageli*, Miq. l. c. 478; *R. subtriflora*, Bl. Mus. Lugd. Bat. I. 79; Miq. l. c. 479; *R. Muelleri*, Bl. l. c.; Miq. l. c.), leaves beneath covered with a close minute silvery white pubescence, turning sometimes greyish when old; flowers usually fewer, or only 2 or solitary in the leaf-axils.

HAB. Var. *a.* Tenasserim, from Moulmein down to Mergui (Falconer, Helf. 2344; Griff. 2344; Wall. etc.)—Fl. Aug.

### **Psidium, L.**

\*1. *P. GUYANA*, L. sp. pl. 470; Bth. Fl. Hongk. 120.

Var. *a. PYRIFERUM*, (*P. pyriferrum*, L. sp. pl. 672; DC. Prod. III. 233; Roxb. Fl. Ind. II. 480; Bot. Reg. t. 1079; Rheed. Hort. Mal. III. t. 34), peduncles 1-flowered; fruits pear-shaped.

Var. *β. POMIFERUM*, (*P. pomiferum*, L. sp. pl. 672; DC. l. c. 234; Roxb. l. c.; Rheed. Hort. Malab. III. t. 48), peduncles usually 2-flowered, with a third flower in the axil of the forking; fruits globular or ovoid.

HAB. Now generally cultivated all over the country, and often as wild in village-woods.—Fl. Apr., May; Fr. RS.

### **Eugenia, L.**

#### *Conspectus of Species.*

*Subg. I. Syzygium*, Gærtn. Calyx smooth inside, without intrastaminal thickened ring. Calyx-limb often obsolete and turning truncate after defloration. Petals free or often cohering in a deciduous calyptra. Flowers usually small. Berries often small, globular to ovoid and cylindrical, more or less sappy, 1- rarely 2-seeded.

\* *Calyx elongate and cylindrical, or shorter and obversely conical.*—(*Acmona*, Wight).

× Flowers in simple or almost simple axillary racemes sometimes much reduced. Calyx much elongato. Berries ovoid.

Calyx tubular-narrowed, 1— $\frac{1}{2}$  in. long, the lobes broad and rounded ; berries about an inch long, ovoid-oblong, crowned by the calyx-lobes, ..... *E. claviflora*.

Calyx club-shaped,  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, the limb truncate ; berry clavate-oblong, only  $\frac{1}{4}$ — $\frac{1}{2}$  in. long, crowned by the cup-shaped truncate calyx-limb, ..... *E. leptantha*.

× × Flowers in more or less corymb-like axillary and terminal panicles.

Calyx more or less obconical.

+ Calyx at base pedicel-like contracted.

Calyx smooth ; leaves somewhat glaucous and rather opaque beneath ; berries black, .. *E. grata*.

Calyx (dried) granular-rough ; leaves rather glossy beneath ; berries white,

.. *E. Zeylanica*.

+ + Calyx sessile, not narrowed pedicel-like at base.

Leaves more or less linear, net-veined between the remote indistinct irregular lateral nerves ; shrub, ..... *E. contracta*.

Leaves more or less oblong, somewhat glaucescent beneath, not net-veined between the close-set parallel lateral nerves ; tree, ..... *E. bracteolata*.

\* \* Calyx hemispherical to funnel-shaped, sessile or contracted pedicel-like at the base.

× Leaves usually opaque, green, the lateral nerves more or less distant, somewhat irregular, net-veined between. Inflorescence usually lateral from the older branches.

• + Calyx sessile, not tapering pedicel-like at the base.

† Leaves green on both sides.

Petiole  $\frac{1}{2}$ — $\frac{2}{3}$  in. long ; leaves broader, not decurrent ; flowers more than 3 together ; panicle longer peduncled, the last ramifications very short, ..... *E. operculata*.

As preceding, but leaves more obovate ; panicle very short peduncled or almost sessile, more lax ; flowers often by threes, ..... *E. obovata*.

Leaves acuminate-decurrent on a short petiole, more acuminate, ..... *E. Paniata*.

† † Leaves glaucous or glaucescent beneath.

Branchlets terete or nearly so ; panicles more or less peduncled ; calyx soon truncate, the lobes obsolete, ..... *E. cinerea*.

• + + Calyx narrowed into a longer or shorter pedicel-like base. Panicle short, sessile or nearly so, usually branched already from the base.

† Calyx-lobes well-developed, up to  $\frac{1}{2}$  line long.

Similar to *E. cinerea*, the branchlets greyish ; calyx-lobes  $\frac{1}{2}$  lin. long, ... *E. præcox*.

Branchlets brownish ; racemes sometimes corymb-like, slender, short, ... *E. cerasoides*.

† † Calyx soon truncate, the lobes obsolete.

Branchlets brown, 4-cornered, often winged so especially while young... *E. tetragona*.

Branchlets white, terete ; panicles cyme-like, short, ..... *E. balsamea*.

× × Leaves usually glossy, often drying blackish or brownish, the lateral nerves all thin and vein-like, more or less crowdedly parallel-running.

+ Calyx narrowed into a longer or shorter pedicel-like base.

† Inflorescence lateral from the older branchlets.

Calyx a line long, almost sessile ; ramifications of panicle sharply 4-cornered ; berries ovoid, the size of a pea ; branchlets brownish, ..... *E. fruticosæ*.

Calyx 2 lin. long, tapering into a thick pedicel-like base ; ramifications of the panicle, absolutely 4-cornered ; berries ovoid-oblong,  $\frac{1}{2}$  in. long ; branchlets white,

.. *E. Jambolana*.

† † Inflorescence terminal (and often also axillary on the same branch).

‡ Branchlets brown.

O Leaves bluntish acuminate to blunt.

Leaves thin coriaceous, the lateral nerves thin but distinct; petiole 3 lin. long, slender,  
.. *E. cymosa*.

Leaves firmly coriaceous, the lateral nerves obsolete; petiole thick, not above a line long, ..... *E. myrtifolia*.

O O Leaves long and sharply acuminate.

Leaves almost chartaceous, pale coloured beneath; petiole about 2 lin. long,  
.. *E. acuminatissima*.

‡ ‡ Branchlets white.

Leaves bluntish acuminate, almost chartaceous, elegantly transversely veined, .. *E. venusta*.

+ + Calyx not or scarcely contracted at the base, sessile. Leaves blackish or reddish in drying.

† Branchlets white.

Leaves chartaceous; calyx-lobes about a line long; petals 2 lin. long or longer; filaments 4—5 lin. long, ..... *E. rubens*.

Leaves coriaceous, the lateral nerves strong and prominent; calyx-lobes and petals shorter; filaments 2—3 lin. long; berries obovoid, ..... *E. Thunra*.

† † Branchlets red-brown.

Like preceding, but lateral nerves thin and vein-like; berries almost globular, the size of a large cherry, ..... *E. oblata*.

*Subg. II. Jambosa*, DC. Calyx inside usually with a circular or 4-angular intra-staminal ring, or the stamens inserted on the thickened ring itself; flowers often large; calyx-lobes conspicuous and persistent. Berries usually large, more or less turbinate or ovoid, the endocarp thick and fleshy. Seeds large.

\* *Calyx-lobes in fruit spreading.*

× Calyx less than  $\frac{1}{2}$  in. long.

+ Flowers sessile. Flowers in terminal and often also in ~~axillary~~ panicles.

† Leaves glossy, firmly coriaceous, the lateral nerves thin and parallel.

Leaves 5—6 in. long, blunt or nearly so; panicle corymb-like, peduncled; berry obovoid-pear-shaped, about  $\frac{1}{2}$  in. long, ..... *E. grandis*.

Leaves only 2—3 in. long, decurrent at the base, bluntish acuminate, .. *E. lepidocarpa*.

Leaves cuneate at the base; panicles sessile, reduced and cluster-like, the ramifications very short and thick, joint-like, ..... *E. pachyphylla*.

† † Leaves opaque, coriaceous, the lateral nerves curved and distant.

Leaves long-petioled; panicle terminal, corymb-like, ..... *E. tristis*.

+ + Flowers pedicelled. Leaves more or less chartaceous, the lateral nerves curved.

Panicles axillary and terminal; calyx-base thick, pedicel-like, the true pedicel very short or almost wanting; leaves thin coriaceous, ..... *E. lanceifolia*.

Panicle almost corymb-like, little branched from the base; calyx-base clavate-narrowed, the true pedicel 3—6 lin. long; leaves coriaceous, ..... *E. albiflora*.

Racemes simple, slender, lateral or axillary; calyx-base filiform and pedicel-like, the true pedicels long and filiform; leaves membranous, ..... *E. Kurzii*.

× × Calyx an inch long or longer.

Leaves large, almost sessile, cordate or rounded at the base; corymbs lateral and terminal, ..... *E. formosa*.

\* \* Calyx-lobes in fruit incurved or inflexed.

× Flowers sessile or nearly so.

Leaves cordate or rounded at the base, the petiole very short and thick; corymbs terminal, ..... *E. macrocarpa*.

Leaves sessile with a cordate base, blunt; branchlets white, terete; corymbs small, lateral, ..... *R. amplexicaulis*.

Leaves acuminate at both ends; panicle cluster-like reduced and lateral,

.. *E. Malaccensis*.

× × Flowers truly or spuriously pedicelled.

+ Leaves opposite.

† Leaves rounded at the base. Fruits obversely turbinate, waxy, white or rose-coloured.

Branchlets usually 4-cornered and often wingedly so, white or pale rose-coloured; leaves acuminate, the intramarginal nerve as strong as the lateral nerves themselves,

.. *E. aqua*.

Branchlets terete, brown; leaves bluntish, the intramarginal nerve faint and obscure,

.. *E. Javanica*.

† † Leaves narrow, acute at the base, petioled.

Berries almost globular or ovoid, dull-yellow, ..... *E. Jambos*.

+ + Leaves whorled by threes, narrow, obtuse at the base.

Leaves linear or linear-lanceolate, almost sessile; petals 4—16, ..... *E. polypetala*.

1. *E. CLAVIFLORA*, Roxb. Fl. Ind. II. 488; Wight Icon. t. 606.

HAB. Not unfrequent in the tropical forests of the Andamans; also Tenasserim and Chittagong.—Fr. Febr.

2. *E. LEPTANTHA*, Wight Ill. II. 15 and Icon. t. 528. (*Syzygium* sp. Griff. Not. Diot. 654).

HAB. Frequent in the tropical forests along the eastern and southern slopes of the Pegu Yomah, and from Tenasserim to the Andamans.—Fl. Febr.; Fr. Apr., May.

3. *E. GRATA*, Wall. Cat. 3586; Wight Ill. II. 15.

HAB. Tenasserim, apparently frequent.—Fl. Jan., March.

4. *E. ZEYLANICA*, Wight Ill. II. 14 and Icon. t. 73, non Roxb.; Bedd. Fl. Sylv. t. 202. (*Jambosa bracteata*, Miq. Fl. Ind. Bat. I. 437).

HAB. Not unfrequent in the tropical forests of the Andamans; also Tenasserim.—Fl. HS.

5. *E. CONTRACTA*, Wall. Cat. 3602.

HAB. Frequent in the stony or rocky bed of chouns in tropical forests, from Martaban down to Tenasserim.—Fl. March, Apr.

The Martaban specimens dry blackish and have the net-venation less prominent. They may possibly form a large and long-leaved variety of *E. cuneata*, Wall. Cat. 3598.

Another species from Tenasserim (Helf. 2407), near allied to the above, has larger leaves of a thinner texture and very lax net-venation. It is no doubt new, but the inflorescences are too young for description. It has white, while the above has red-brown bark.

6. *E. BRACTEOLATA*, Wight Ill. II. 15 and Icon. t. 531.

HAB. Tenasserim (Griff., Helf.).

7. *E. OPERCULATA*, Roxb. Hort. Beng. 37 and Fl. Ind. II. 486; Wight Icon. t. 552. (*Syzygium nervosum*, DC. Prod. III. 260; Bth. Fl. Hongk. 119).

HAB. Not unfrequent in the swamp-forests of Pegu, Martaban, and Upper Tenasserim.

8. *E. OBOVATA*, Wall. Cat. 3352. A. (*Syzygium polyanthum*, Thw. Ceyl. Pl. 116 and 417).

HAB. Ava (Griff. 2403); hills east of Bhamo (J. Anderson).

9. *E. PANIALA*, Roxb. Fl. Ind. II. 489; Wight Icon. t. 616.

HAB. Chittagong.—Fl. Apr.; Fr. June.

10. *E. CINEREA*, Wall. Cat. 3576.

HAB. Rare in the tropical forests of the Pegu Yomah (southern parts); Tenasserim, from Moulmein down to Mergui.—Fl. Apr.; Fr. Febr.

Possibly not different from the following species, which I know only from Roxburgh's description and figure.

11. *E. PRECOX*, Roxb. Fl. Ind. II. 488; Wight Icon. t. 619.

HAB. Hilly parts of Chittagong (Roxb.).—Fl. Jan.

12. *E. CERASOIDES*, Roxb. Fl. Ind. II. 488; Wight Icon. t. 615 (*Syzygium subnodosum*, Miq. Suppl. Fl. Sumatr. 313; *E. polyantha*, Wight Ill. II. 17 and Icon. t. 543).

Var.  $\beta$ . *ANGUSTIFOLIA*, leaves on shorter and thicker petioles, linear to oblanceolate-linear, with fewer more remote and arcuate nerves; panicles shorter and stouter, the ultimate branchings much reduced; the pedicel-like base of calyx shorter; berries the size of a pepper-kernel, globose, almost sessile, crowned by the truncate calyx-limb.—Probably a distinct species.

HAB. Chittagong; Tenasserim, from Moulmein down to Mergui (Griff., Helf.). Var.  $\beta$ . Ava, Khakyen hills (J. Anderson).—Fr. March.

13. *E. TETRAGONA*, Wight Ill. II. 16.

HAB. Ava, Khakyen hills east of Bhamo, at 3000—4000 ft. elevation.—Fl. Nov., Decb.

14. *E. BALSAMEA*, Wight Ill. II. 16.

HAB. Burma (according to Rev. Dr. Mason).

15. *E. FRUTICOSA*, Roxb. Fl. Ind. II. 487; Wight Icon. t. 624.

HAB. Frequent in the open, chiefly the eng-forests, along the eastern

slopes of the Pegu Yomah, and from Martaban down to Tenasserim; also Chittagong.—Fl. Apr.; Fr. May, June.

16. *E. JAMBOLANA*, Lamk. Dict. III. 198; Wight Icon. t. 535; Roxb. Fl. Ind. 484; Brand. For. Fl. t. 30; Bedd. Fl. Sylv. t. 197.—(*Syzygium Jambolanum*, DC. Prod. III. 259; Miq. Fl. Ind. Bat. I. 458).

HAB. Frequent in all leaf-shedding forests but chiefly in the mixed ones, rarely entering the tropical forests, from Ava and Martaban down to Tenasserim and the Andamans.—Fl. Apr., May; Fr. May, June.

17. *E. CFMOSA*, Lamk. Dict. III. 199, non Roxb.; Wight Icon. t. 555. (*E. toddaloides*, Wight Ill. II. 16 and Icon. t. 542; *Syzygium cymosum*, DC. Prod. III. 259; *Jambosa tenuicuspis*, Miq. Fl. Ind. Bat. I. 431; *Syzygium nelitricarpum*, T. et B. in Nat. Tydsch. Ned. Ind. XXV).

HAB. Tenasserim, Tavoy and Mergui.—Fl. Nov.

18. *E. MYRTIFOLIA*, Roxb. Fl. Ind. II. 490; Wight Icon. t. 618.

HAB. Tenasserim, Moulmein (according to a specimen admixed with Wall. Cat. 3573. A.)

19. *E. ACUMINATISSIMA*, (*Myrtus acuminatissima*, Bl. Bydr. 1088; *Jambosa acuminatissima*, Hassk. in Flora 1849. 592; Miq. Fl. Ind. Bat. I. 438; *E. ferruginea*, Wight Icon. t. 554).

HAB. Tenasserim (or Andamans?) (Helf.)

20. *E. VENUSTA*, Roxb. Fl. Ind. II. 491; Wight Icon. t. 625 (*Syzygium Gardneri*, Thw. Ceyl. Pl. 117?)

HAB. Not unfrequent in the tropical forests of Toukyeghat, east of Tounghoo; Tipperah hills (Roxburgh).—Fl. March, Apr.

21. *E. RUBENS*, Roxb. Fl. Ind. II. 496; Wight Icon. t. 630. (*Jambosa Wightiana*, Bl. Mus. Lugd. Bat. I. 106; Walp. Ann. II. 636).

HAB. Forests of Chittagong (Roxb.); Tenasserim, from Moulmein down to Mergui.—Fl. Febr.—Apr.; Fr. Begin of RS.

If my identification prove correct, then it is only the length of the stamens and a thinner texture of the leaves that separates this species from *E. Thumra*. The petals and sepals, too, are nearly twice the size.

22. *E. THUMRA*, Roxb. Fl. Ind. II. 495; Wight Icon. t. 617.

HAB. Frequent in the tropical forests, especially in marshy places along choungs, of the Pegu Yomah, and from Martaban down to Tenasserim.—Fl. March, Apr.; Fr. May, June.

23. *E. OBLATA*, Roxb. Fl. Ind. II. 493; Wight Icon. t. 622.

HAB. Frequent in tropical forests, especially along marshy choungs, from Martaban down to Tenasserim.—Fl. March—May; Fr. June—Aug.

24. *E. GRANDIS*, Wight Ill. II. 15 and Icon. t. 614 (*E. cymosa*, Roxb. Fl. Ind. II. 492, non Lamk.).

HAB. Frequent in the tropical forests and occasionally in the moist upper mixed forests of the Pegu Yomah, Martaban, and Tenasserim.—Fl. Febr.; Fr. Apr.

25. *E. LEPIDOCARPA*, Wall. Cat. 3618 in part.—(*Syzygium Palembangicum*, Miq. Suppl. Fl. Sumatr. 313 ?).

HAB. In the eng-forests of Upper Tenasserim (Brandis).

26. *E. PACHYPHYLLA*, Kurz in Journ. As. Soc. Beng. 1873. 232.

HAB. Upper Tenasserim, Bithoko range, 3000 ft. (Brandis).—Fl. Apr.

27. *E. TRISTIS*, Kurz in Journ. As. Soc. Beng. 1873. 233.

HAB. In the eng-forests at Lounkim, Tenasserim (Brandis).—Fr. Apr.

28. *E. LANCEFOLIA*, Roxb. Fl. Ind. II. 494; Wight Icon. t. 621.

HAB. Chittagong (Hf. and Th.).—Fl. Nov.; Fr. Febr.

29. *E. KURZII*, Duthie MS. (*E. cerasiflora*, Kurz in Journ. As. Soc. Beng. 1873. 233, non Miq.).

HAB. Rather rare in the tropical forests of Toukyeghat, east of Tounghoo.—Fl. March.

30. *E. ALBIFLORA*, Duthie MS.; Kurz For. Fl. Burma I. 491.

HAB. Burma, probably Ava. (Griff. 2119).

31. *E. FORMOSA*, Wall. Pl. As. rar. II. 6. t. 108 (1831).—(*E. ternifolia*, Roxb. Fl. Ind. II. 149 (1832); Wight Icon. t. 611; *Jambosa formosa*, Wight Ill. II. 14; Miq. Fl. Ind. Bat. I. 412).

HAB. In the tropical forests of Chittagong and Upper Tenasserim.—Fl. Fr. March.

*E. formosa*, of Wall. Cat. 3609 is a mixture of fruits of this species and leaves of *E. Malaccensis*.

32. *E. MACROCARPA*, Roxb. Fl. Ind. II. 497; Wight Icon. t. 612. (*Jambosa macrocarpa*, Miq. Fl. Ind. Bat. I. 417.)

HAB. Frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah, and from Martaban down to Tenasserim, up to 2000 ft. elevation.—Fl. March, Apr.; Fr. Aug.

33. *E. AMPLEXICAULIS*, Roxb. Fl. Ind. II. 483; Wight Icon. t. 608.

HAB. Chittagong (Roxb.).

Specimens in Herb. Brandis (Nos. 1225, 1222, and 1223) from the tropical forests of Upper Tenasserim, come nearest to this species. They differ apparently by the sharply 4-angular branchlets and bluntish acuminate or bluntish leaves. The inflorescence is terminal, but otherwise quite agrees with Roxburgh's figure. The shape of the leaves is very variable, some of them almost agreeing with those of *E. aquea*.

\*34. *E. MALACCENSIS*, L. sp. pl. 672; Roxb. Fl. Ind. II. 483; Wight Illust. II. 14. t. 98 (*Jambosa domestica*, Rumph. Herb. Amb. I. 121. t. 37; Miq. Fl. Ind. Bat. I. 414; *Jambosa Malaccensis*, DC. Prod. III. 288; Bot. Mag. t. 4408; *E. purpurea*, Roxb. Fl. Ind. II. 483; Wight Icon. t. 549; Griff. Not. Dicot. 654).

HAB. Planted in villages of Tenasserim.—Fl. HS.

\*35. *E. AQUEA*, Burm. Fl. Ind. 114; Roxb. Fl. Ind. II. 492; Wight Icon. t. 550. (*Jambosa aquea*, DC. Prod. III. 288; Wight Icon. t. 216; Miq. Fl. Ind. Bat. I. 421).

HAB. Apparently only planted; Chittagong, Ava, Pegu, Martaban, and Tenasserim.—Fl. March, Apr.; Fr. May, June.

36. *E. JAVANICA*, Lamk. Encycl. III. 200. (*E. alba*, Roxb. Fl. Ind. II. 493; Wight Icon. t. 548; *Jambosa alba*, Rumph. Herb. Amb. I. 127. t. 39; Miq. Fl. Ind. Bat. I. 413).

HAB. Frequent in the coast-forests of the Andaman islands.—Fl. March, Apr.; Fr. May, June.

\*37. *E. JAMBOS*, L. sp. pl. 672; Roxb. Fl. Ind. II. 494; Wight Illust. II. 14. (*Jambosa vulgaris*, DC. Prod. III. 286; Wight Icon. t. 435; Miq. Fl. Ind. Bat. I. 425).

HAB. Frequently planted in villages all over Burma.—Fl. May—July; Fr. CS.

38. *E. POLYPETALA*, Wall. Cat. 3616; Wight Ill. II. 14 and Icon. t. 610. (*E. angustifolia*, Roxb. Fl. Ind. II. 490, non Lamk.).

HAB. Chittagong (Roxb.).—Fl. March, April; Fr. June, July.

### **Barringtonia**, Forst.

#### *Conspectus of Species.*

*Subg. I. BUTONICA*, Rumph. Calyx closed in bud, entire, valvately rupturing into 2 to 4 lobes. Ovary 4-celled. Flowers pedicelled.

\* *Fruite angular, without appendages, 1-seeded.*

Flowers about 3 in. in diameter or larger, in corymb-like short erect racemes; leaves entire, sessile, ..... *A. Asiatica*.

Flowers about an in. in diameter, in long slender pendulous racemes; leaves crenulate, very shortly petioled, ..... *B. racemosa*.

\* \* *Fruit conically pyramidal, with short wing-like basal appendages.*

Leaves serrulate; racemes rather erect, puberous, ..... *B. conoidea*.

*Subg. II. STRAVIDIUM*, Juss. Calyx already in bud 3—4-cleft, the lobes imbricate.

\* *Ovary 4-celled. Rachis of raceme very thick.*

+ Calyx-tube winged; fruits narrowly winged on the corners. Flowers sessile.

Calyx-lobes rounded, 2 lin. long; leaves obtuse or acute at the base, not decurrent,

... *B. angusta*.

Calyx-lobes triangular-ovate, more or less acute, more than 3 lin. long; leaves long-decurrent, ..... *B. pterocarpa*.

+ + Calyx-tube terete or angular, not winged.

x Flowers sessile.

Leaves elongate, entire, long-petioled; calyx angular, ..... *B. macrostachya*.

x x Flowers pedicelled.

Leaves elongate, long-petioled; calyx torcite, ..... *B. pendula*.

\* \* Ovary 2-celled. Rhachis of raceme slender. Flowers pedicelled. Fruits sharply 4-angular.

Glabrous or pubescent; flowers rather small, red; leaves crenulate, shortly petioled, .. *B. acutangula*.

1. *B. ASIATICA*, (*Mammea Asiatica*, L. sp. pl. 731; *B. speciosa*, L. f. Suppl. 312; Roxb. Fl. Ind. II. 636; Wight Icon. t. 547; Miq. Fl. Ind. Bat. I. 485, vix Forst.; Paxt. Bot. Mag. X. 241. cum icon.; Houtt. Fl. d. serr. IV. 409 cum icon.; *Agasta Asiatica*, Miers in Linn. Trans. 2nd ser. Bot. I. 61. t. 12. f. 10—16; *Agasta Indica*, Miers l. c. 63. t. 12. f. 1—10).

HAB. Frequent in the coast-forests, especially the beach-forests, of the Andamans; most probably also in those of Tenasserim.—Fl. Fr. HS. ..

2. *B. RACEMOSA*, DC. Prod. III. 288; Roxb. Fl. Ind. II. 634; Freyc. lt. Bot. 483. t. 107; Wight Icon. t. 151; Miq. Fl. Ind. Bat. I. 486; Griff. Not. Dicot. 659. t. 636. f. 2?; Hook. Bot. Mag. t. 3831.—(*Eugenia racemosa*, L. sp. pl. 673; *Butonica racemosa*, Juss. gen. 326; Miers in Linn. Trans. 2nd. ser. I. 66. t. 13. f. 11—17.; *Butonica rubra*, Miers l. c. 70. t. 14. f. 1—3; *Butonica terrestris*, Rumph. Hb. Amb. III. 181. t. 115; Miers l. c. 69. t. 14. f. 4—9; *Butonica inclyta*, Miers l. c. 71. t. 14. f. 19?; *Butonica Zeylonica*, Miers l. c. 77).

HAB. Frequent in the coast-forests, especially the beach-forests, of Tenasserim and the Andamans.—Fl. April; Fr. May, June.

3. *B. CONIDEA*, Griff. Not. Dicot. 656. t. 635 and t. 636. f. 1. (*B. alata*, Wall. Cat. 3633; *Butonica alata*, Miers in Linn. Trans. 2nd. ser. I. 70. t. 14. f. 10—15).

HAB. Coast-forests of Tenasserim from Moulmein southwards.—Fl. April.

Miers brings part of this species to his *B. alba* and in this case, as elsewhere, accuses the editor of Griffith's Posthumous Papers of having confused the plates, but in this he is greatly in error.

4. *B. AUGUSTA*, Kurz in Journ. As. Soc. Beng. 1873. 233 (*Doxomma augustum*, Miers in Linn. Trans. 2nd. ser. I. 105).

HAB. Tenasserim, from Moulmein southwards.—Fl. Febr.

5. *B. PTEROCARPA*, Kurz in Journ. As. Soc. Beng. 1873. 234. (*Doxomma magnificum*, Miers in Linn. Trans. 2nd ser. I. 106?).

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, and Martaban down to Tenasserim.—Fl. March, April; Fr. June.

Very nearly allied to the preceding, from which it differs in the few characters above given. The unripe fruits a good deal resemble those of *Doxomma Cochinchinense*, Miers (l. c. t. 16. f. 2), but this species has very long slender petioles.

6. *B. MACROSTACHYA*, (*Careya macrostachya*, Jack Mal. Misc. 47.; DC. Prod. III. 295; *Doxomma macrostachyum*, Miers in Linn. Trans. 2nd ser. I. 104.; *B. cylindrostachya*, Griff. Not. Dicot. 655; *Doxomma cylindrostachyum*, Miers l. c. 100; *Stravadium sarcostachys*, Bl. in v. Houtt. Fl. d. serr. VII. 24.; *B. sarcostachys*, Miq. Fl. Ind. Bat. I. 490; *Doxomma sarcostachys*, Miers l. c. 102; *Doxomma acuminatum*, Miers l. c. ?).

HAB. Tenasserim, in the forests of Mergui (Griff. 2421/2); (Ava, accord. Miers).

7. *B. PENDULA*, (*Doxomma pendulum*, Miers in Linn. Trans. 2nd ser. I. 99. t. 15. f. 9—15; *Careya pendula*, Griff. Not. Dicot. 661. t. 634.)

HAB. Tenasserim, Mergui (*teste* Miers).

8. *B. ACUTANGULA*, Gærtn. Fruct. II: 96. t. 101; WA. Prod. I. 333; Miq. Fl. Ind. Bat. I. 488; Bedd. Fl. Sylv. t. 204; Roxb. Fl. Ind. II. 635. (*Eugenia acutangula*, L. sp. pl. 673; *Stravadium acutangulum*, Miers. in Linn. Proc. 2nd ser. I. 80, t. 17. f. 1—14; *Stravadium obtusangulum*, Bl. in v. Houtt. Fl. d. serr. VII. 24; Miers l. c. 81.; *Stravadium demissum*, Miers l. c. 81; *Stravadium Rheedii*, Bl. in v. Houtt. Fl. d. serr. VII. 24; Miers l. c. 82; *Stravadium pubescens*, Miers l. c. 83; *Stravadium coccineum*, DC. Prod. III. 289 ?; Miers. l. c. 83 ?).

HAB. Frequent in the mixed forests, especially the lower ones and the savannahs, common in the swamp-forests, all over Burma from Chittagong and Ava down to Tenasserim.—Fl. April, May; Fr. June, July.

### *Careya*, Roxb.

#### ● *Conspectus of Species.*

*Subg. I. CAREYA*, Roxb. Outermost and innermost series of stamens reduced to filaments. Embryo consolidate.

\* *Flowers long-pedicelled.*

Undershrub; berries only an in. thick; seeds about 3 lin. long, ..... *C. herbacea*.

\* \* *Flowers sessile. Trees.*

Petals blunt or rounded, concave. Ovules in 2 rows in each cell, ..... *C. arborea*.

Petals acute, the borders revolute. Ovules in 6 rows in each cell, ..... *C. sphaerica*.

*Subg. II. PLANCHONIA*, Bl. Only the innermost row of stamens reduced to filaments. Embryo of 2 distinct cotyledons.

Fruits ellipsoid, angular-ribbed, ..... *C. valida*.

1. *C. ARBOREA*, Roxb. Corom. Pl. III. 13. t. 218 and Fl. Ind. II. 638; Wight Icon. t. 556, sub nom. *erron. C. sphaerica*, and Illust. II. t. 99 and 100; Miq. Fl. Ind. Bat. I. 494; Miers in Linn. Trans. 2nd ser. I. 97; Bedd. Fl. Sylv. t. 205 (*C. orbiculata*, Miers l. c. 98. t. 16. f. 6—8).

HAB. Frequent in the open forest and the lower mixed and savannah-forests, all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim.—Fl. April, May; Fr. June, July.

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2. *C. SPHÆRICA*, Roxb. Fl. Ind. II. 636; Wight Icon. t. 147; Miq. Fl. Ind. Bat. I. 494; Miers in Linn. Trans. 2nd ser. I. 97. t. 16. f. 9—15 ?).

HAB. Mountains of Chittagong (Roxb.).—Fl. April; Fr. July.

3. *C. VALIDA*, (*Pirigara valida*, Bl. Bydr. 1096; *Planchonia valida*, Miers in Linn. Trans. 2nd ser. I. 94; *Planchonia littoralis*, Bl. in v. Hoult. Fl. d. serr. VII. 25; Miers l. c. 94).

HAB. Frequent in the coast-forests of the Andaman islands.—Fl. HS.

### *Doubtful Genus.*

1. *Leucymmaea salicifolia*, Prsl. Epim. Bot. 211; Walp. Ann. III. 891.

HAB. Tenasserim, Moulmein (Helfer).

A genus which is entirely enigmatic to me; the gamopetalous corolla and the insertion of the very numerous stamens on the bottom of the calyx form a puzzling combination of characters. If the corolla be incorrectly described, we may guess *Myrtaceæ* as its probable affinity.

## *MELASTOMACEÆ.*

### *Conspectus of Genera.*

*Subord. I. MELASTOMEÆ.* Ovary 2- or more-celled, the placentas attached to the middle or base of the axial angle, usually elongate, rarely sessile. Seeds usually numerous and minute, rarely few and large. Leaves usually 3—7-nerved from the base.

\* Placentas attached to the middle of the axial angle. Anthers opening by 1 or 2 apical pores.

× Capsule dry or rarely sappy, dehiscent by apical valves, rarely irregularly rupturing.

*Trib. 1. OSBECKIÆ.* Ovary with a conical or convex free apex. Connective usually produced beyond the base of the anthers. Capsule dry or berry-like. Seeds minute, cochleate.

OSBECKIA. Anthers usually all equal or nearly so. Fruit a capsule.

OTANTHERA. Anthers equal. Fruit a berry.

MELASTOMA. Anthers always unequal. Fruit a berry.

*Trib. 2. OXYSPOREÆ.* Connective acute or spurred behind, not appendaged in front. Seeds angular or oblong to club-shaped.

\* OXYSPORA. Calyx costate. Stamens 4, equal, or 8 and usually unequal. Ovary and the club-shaped capsule high-up adnate to the calyx. Flowers laxly cymose, in terminal panicles.

ALLOMORPHIA. Calyx costate. Stamens 8 or 10, nearly equal. Ovary free or adnate to the bottom of the calyx. Capsule ovoid, included in the urceolate costate calyx. Flowers clustered or almost whorled, in narrow terminal panicles.

**OCHTHOCHARIS.** Calyx terete and smooth. Stamens 10, equal. Ovary and capsule adnate to the calyx, the latter globular, smooth. Cymes often axillary, or rarely collected into terminal panicles.

**ANERINCLEISTUS.** Calyx terete. Anthers 8, equal. Capsule 4-valved at the top, almost free. Flowers in axillary fascicles or umbellets.

*Trib. 3. SONERILLEÆ.* Ovary broadly carved out and depressed at the 3- to 5-cornered top. Connective rarely produced at the base. Capsule opening at the top into triangular valves, 3—5-cornered, rarely terete. Seeds minute, straight, angular (never cochleate).

**SONERILA.** Flowers 3-merous. Stamens 3 or 6. Capsule 3-celled. Herbs, or rarely undershrubs, sometimes stem-less.

**SARCOPIYAMIS.** Flowers 4-merous. Stamens 8. Capsule 4-celled, included in the succulent calyx. Succulent glabrous herbs.

× × Berry sappy or coriaceous, irregularly rupturing.

*Trib. 4. MEDINILLEÆ.* Ovary wholly, or only its angles, adnate to the calyx, the convex or conical top free. Stamens conform, or the alternating ones reduced to curiously shaped staminodes, inserted on the limb or thrust into the cavities formed by the adhesion of the ovary-angles to the calyx; anthers usually recurved.

× Stamens very unequal.

**DISSOCHÆLA.** Anthers 4 or 8, the connective with 2 bristles or lamellæ in front, often spurred behind. Panicles terminal.

**ANPICTRUM.** Anthers 4 or 8, the connective usually not appendaged in front, shortly spurred behind. Ovary 4-crested at the top. Panicles often axillary.

× × Stamens almost equal.

**MEDINILLA.** Calyx-tube not or barely produced beyond the ovary. Anthers 8, 10, or 12, 2-lobed or 2-spurred in front, often bristly, 1—2-lobed or 1-spurred behind. Ovary 4—6-celled. Erect or scandent shrubs.

\* \* Placentas inserted to the base of the axial angle or to the walls of the cells. Anthers opening by longitudinal slits.

*Trib. 5. ASTRONIEÆ.* Ovules numerous. Berry coriaceous or succulent, many-seeded, the seeds minute.

**PTERNANDRIA.** Calyx smooth or scaly, the limb truncate, obscurely 4-lobed. Stamens 8. Trees or shrubs.

*Subord. II. MEMECYLEÆ.* Ovary 1-celled, with a free central placenta to which 6 or more ovules are attached in a whorl. Berry succulent or coriaceous, 1-seeded. Embryo large, the cotyledons much folded and leafy.

**MEMECYLON.** Anthers 8, equal. Trees or shrubs, with penninerved or very rarely 3-nerved leaves.

### Osbeckia, L.

#### Conspectus of Species.

*Petals 8. Stamens 3.*

× Flowers small. Calyx-tube bell-shaped. Anthers short, truncate or abruptly beaked.

Calyx not ribbed, glabrous or more or less covered with long fringed scales; anthers prolonged into a bristle-like beak, ..... *O. Chinensis.*

× × Flowers rather large and conspicuous. Calyx-tube elongate urceolate, in fruit produced into a tubular neck overtopping the bristled crown of the capsule. \*

Bristly hairy; calyx covered with peltate stellate-bristly scales, the ciliate lobes linear-subulate, alternating with as many minute teeth conform with the lobes; branches 4-cornered, ..... *O. crinita*.

Almost glabrous or minutely bristly; calyx sparingly sprinkled with minute ciliate scales, or smooth, the lobes lanceolate, usually ciliate, alternating with minute ciliate teeth; branchlets 4-cornered, ..... *O. rostrata*.

\* \* *Petals 5. Stamens 10.*

More or less densely pubescent; petiole very short or the leaves almost sessile; bracts broadly obovate; calyx loosely covered with rotundate fringed scales,

.. *O. Nepalensis*.

More or less appressed bristly, the branches much tubercled; petiole  $\frac{2}{3}$ —1 in. long; bracts lanceolate; calyx appressed setose, ..... *O. aspericaulis*.

1. *O. CHINENSIS*, L. sp. pl. 490; DC. Prod. III. 141; Triana in Linn. Trans. XXVIII. 53. (*O. angustifolia*, Don. Prod. Nep. 221; DC. l. c. 142; Wall. Pl. As. rar. III. t. 251; Naud. in Ann. d. sc. nat. 3 ser. XIV. 69).

Var. *a. GENUINA*, flowers sessile; calyx-tube not or sparingly ciliate-scaly, about 3 lin. long or longer, the lobes broad, about as long as the tube.

Var. *β. LINEARIS*, (*O. linearis*, Bl. Mus. Lugd. Bat. I. 51; Naud. in Ann. d. sc. nat. 3 ser. XIV. 70 and XIII. t. 7. f. 4; *O. Zeylanica*, DC. Prod. III. 141; Roxb. Fl. Ind. II. 223), calyx somewhat smaller and shorter, almost spherical, more or less covered with long-hairy scales, sometimes (in bud) appearing densely pilose; flowers nearly twice as large, on short pedicels, the calycine lobes shorter and narrower.

. . HAB. Frequent on grassy or waste places of the plains, and more so in the open forests, all over Pegu.—Fl. Fr. Decb.

2. *O. ROSTRATA*, Don. Prod. Nep. 221; Trian. in Linn. Trans. XXVIII. 53. (*O. quaterna*, Ham. in Don. l. c. 222).

Var. *a. PULCHELLA*, Triana l. c. 54 (*Melastoma pulchellum*, Roxb. Fl. Ind. II. 403; *O. pulchella*, Bth. ap. Naud. in Ann. d. sc. nat. 3 ser. XIV. 73.), the 4-cornered stems and branchlets and leaf-nerves minutely bristly; calyx-tube covered with ciliate scales.

Var. *β. LONGICOLLIS*, Triana l. c. 54, leaves, the 4-cornered stem and branches glabrous, the latter usually bristly fringed between the petioles; calyx and its lobes quite glabrous, or only the latter ciliate.

? Var. *γ. TERNIFOLIA*, Trian. l. c. 54 (*O. ternifolia*, Don. Prod. Nep. 221; DC. Prod. III. 142; Wall. Pl. As. rar. III. 21. t. 239), pretty glabrous, branches 8-cornered, calyx less stellate-bristly, apparently without additional teeth between the lanceolate-linear calyx-lobes.

HAB. Var.  $\alpha$ . in Chittagong (Roxb.) ; not unfrequent on hill-pastures and the drier hill-forests especially the pine-forests, of the Martaban hills, at 3500 to 5000 ft. elevation ; var.  $\beta$ . on jungle pastures of the low forests of Pegu ; var.  $\gamma$ . Taong-dong and Rangoon, *teste* Triana.—Fl. Decb. ; Fr. March—June.

3. O. CRINITA, Bth. ap. Naud. in Ann. d. sc. nat. XIV. 72 ; Triana. in Linn. Trans. XXVIII. 53 (*Melastoma crinitum*, Roxb. Fl. Ind. II. 402).

HAB. Chittagong (Roxb.) ; not unfrequent in the drier hill-forests, especially in open grassy places, of the Martaban hills east of Tounghoo, at 4000 to 7000 ft. elevation.—Fr. March.

4. O. NEPALENSIS, Hook. Fl. Exot. t. 31 ; Naud. in Ann. d. sc. nat. Bot. XIV. 68 and XIII. t. 7. f. 2 ; Bot. Reg. t. 1475 ; Triana in Linn. Trans. XVIII. 55.

HAB. Ava, Khakyen hills.—Fr. March.

5. O. ASPERICAULIS, Hf. in Linn. Trans. XXVIII. 55.

HAB. Tenasserim ? (Helf. 2244). \*

#### Otanthora, Bl.

1. O. BRACTEATA, Korth. Verh. Nat. Gesch. Bot. 235. t. 51 ; Naud. in Ann. d. sc. nat. 3 ser. XIII. 354 ; Miq. Fl. Ind. Bat. I. 516 ; Triana in Linn. Trans. XXVIII. 55.

HAB. Apparently frequent in Tenasserim, from the Attaran district southwards to Mergui.—Fl. Febr.—July.

#### Melastoma, L.

##### Conspectus of Species.

× Leaves more or less appressed bristly hairy or pubescent.

+ Calyx covered with closely appressed chaffy scale-like bristles.

Scales of calyx about  $\frac{1}{2}$  lin. long or longer, often rather broad, the calycine lobes shorter, often only half as long as the tube ; leaves usually appressed-strigose on both sides, usually acute, ..... *M. Malabathricum*.

Scales of calyx up to a line long, chaffy, ciliate or finely cleft, the calycine lobes about as long as the tube, ovate to lanceolate, acuminate, alternating with as many short subulate teeth ; leaves on both sides, or beneath only, softly appressed-pubescent, usually acuminate, ..... *M. normale*.

+ + Calyx covered with squarrose more or less spreading scale-like bristles about 2 lin. long.

Leaves softly appressed-pubescent on both sides, ..... *M. Houtteanum*.

× × Leaves glabrous, or only with a few scales on the nerves beneath.

Calyx covered with long fine spreading curved bristles, the accessory teeth nearly as long as the calyx-lobes themselves, ..... *M. decemfidum*.

1. *M. MALABATHRICUM*, L. sp. pl. 559 ; Roxb. Fl. Ind. II. 405 ; Naud. in Ann. d. sc. nat. 3 ser. XIII. 285 ; WA. Prod. I. 324 ; Bot. Reg. t. 672 ; Wight Ill. I. t. 95 ; Trian. in Linn. Trans. XXVIII. 59. (*Tremblaya rhyanthra*, Griff. Not. Dicot. 677).

HAB. Common in shrubbery and waste places, along river-sides, in savannahs, along borders of forests, &c., all over Burma down to Tenasserim.—Fl. Fr. ∞.

I have no clear idea as to the differences between the various species of this alliance. Bentham reduces all the 40 species enumerated by Naudin (in Ann. d. sc. l. c. 283—293) as “species magis ad *M. Malabathricum* vergentes ideoque difficilius distinguendæ,” while Triana keeps most of them distinct without assigning diagnostic characters to them.

N. B. *M. imbricatum*, Wall. (nomen nudum) Trian. in Linn. Trans. XXVIII. 60 = *M. fusciculare*, Naud. in Ann. d. sc. nat. 3 ser. XIII. 288, from Tenasserim or the Andamans (Helf. 2243), is unknown to me.

2. *M. NORMALE*, Don. Prod. Nep. 220; DC. Prod. II. 145; Naud. in Ann. d. sc. nat. 3 ser. XIII. 289; Triana in Linn. Trans. XXVIII. 60. (*N. Nepalense*, Lodd. Bot. Cab. t. 707.)

HAB. Frequent in the drier hill-forests of Martaban, up to 5000 ft. elevation; Ava, Khakyen-hills.

3. *M. HOUTTEANUM*, Naud. in Ann. d. sc. nat. 3 ser. XIII. 291.

HAB. Here and there in the tropical forests of the eastern slopes of the Pegu Yomah; also Andamans (*teste* Triana); Martaban, from Moulmein southwards (Brandis; Helf. 2241).—Fl. March.

### Oxyspora, DC.

#### Conspectus of Species.

Glabrous; branchings of panicle 4-cornered or 4-winged; bracts &c. persistent; connective without any appendage, ..... *O. cernua*.

Stems and petioles often hairy; panicle-branchings terete; bracts very deciduous; connective spurred at the base of the back, ..... *O. vagans*.

1. *O. CERNUA*, Hf. and Th. ap. Triana in Linn. Trans. XXVIII. 73. (*Melastoma cernua*, Roxb. Fl. Ind. II. 404; *Allozygia cernua*, Naud. in Ann. d. sc. nat. 3 ser. XV. 309. t. 15. f. 5.)

HAB. Chittagong (Roxb.).—Fl. Oct., Nov.; Fr. Febr., March.

### Allomorpha, Bl.

#### Conspectus of Species.

Habit of *A. Griffithii*, the stems, petioles and the 9 strong ribs beneath densely covered with long brownish bristles; calyx-teeth minute, ..... *A. hispida*. Quite glabrous; leaves 5-ribbed; calyx-lobes with a thick wing-like appendage on the back, ..... *A. umbellulata*.

1. *A. HISPIDA*, Kurz in Journ. As. Soc. Beng. 1871. 53.

HAB. Upper Tenasserim (Brandis).

2. *A. UMBELLULATA*, Hf. in Linn. Trans. XXVIII. 74.

HAB. Tenasserim, Mergui Archipelago, on the island St. Mathia (Helf. 2660).

**Ochthocharis, Bl.**

1. *O. JAVANICA*, Bl. Bydr. Nat. Wet. VI. 264 and Mus. Bot. Lugd. Bat. I. 40; Naud. in Ann. d. sc. nat. 3 ser. XV. 307; Miq. Fl. Ind. Bat. I. 556; Trian. in Linn. Trans. XXVIII. 74.

HAB. Tenasserim (Helf. 2277).

**Anerincleistus, Korth.***Conspectus of Species.*

Calyx softly appressed-pubescent, ..... *A. Helferi*.

Calyx very densely and spreadingly hirsute, ..... *A. Griffithii*.

1. *A. HELFERI*, Hf. in Linn. Trans. XXVIII. 75.

HAB. Tenasserim (or Andamans?) (Helf. 2304).

2. *A. GRIFFITHII*, Hf. in Linn. Trans. XXVIII. 75.

HAB. Mergui Archipelago (Griff. 2304).

**Sarcopyramis, Wall.**

1. *S. LANCEOLATA*, Wall. in Benn. Pl. Jav. rar. 214. (*S. grandiflora*, Griff. Not. Dicot. 678 t. 639. f. 2.).

HAB. Not unfrequent in dark ravines and along torrents in the damp hill-forests of the Nattoung mountains east of Tounghoo, at 6000—7000 ft. elevation; also Ava hills.—Fl. Fr. March.

**Sonerila, Roxb.***Conspectus of Species.*

\* *Capsules terete or trigonously-terete.*

× Anthers elongate.

Annual, 2 ft. high, glabrous or nearly so; leaves narrow-linear, serrulate, .. *S. linearis*.

× × Anthers short.

Annual, about  $\frac{1}{2}$  ft. high, puberulous; calyx slightly downy and glandular-hairy, .. *S. stricta*.

\* \* *Capsules sharply 3-gonous or 3-quetrous.*

× Anthers short.

Small annual, 1—5 in. high, sparingly and spreadingly gland-hairy; leaves 4—8 lin. long, ovate to oval; capsule usually with a few hairs, ..... *S. tenera*.

× × Anthers long-acuminate.

+ Caulicent herbs.

† Stem short and very thick, scarred.

Quite glabrous; leaves lanceolate, decurrent, 4—7 in. long, ..... *S. Brandisiana*.

† † Stems elongate, slender and leafed.

Herb 1—1 $\frac{1}{2}$  ft. high, sparingly hairy; leaves 3—4 in. long, more or less cordate at the base, docussately opposite; capsules glabrous, ..... *S. maculata*.

As preceding, but leaves whorled, ..... *S. secunda*.

+ + Scapigerous stemless herbs.

Leaves 5—7-plinerved; calyx 4-toothed; petals oblong, acuminate, .... *S. violafolia*.

Leaves penni-nerved, ciliate; petals obovate, cuspidate; anthers about a line long,

.. *S. nudiscapa*.

1. *S. LINEARIS*, Hf. in Linn. Trans. XXVIII. 76.

HAB. Upper Tenasserim, Moulmein, on the "Gevai" hill, at 3000 ft. elevation (Lobb.).

2. *O. STRICTA*, Hook. Bot. Mag. t. 4394.

HAB. Tenasserim, Moulmein (Lobb.).

3. *S. TENERA*, R. Br. in Wall. Cat. 4098; Royle Ill. Him. Pl. 250. t. 45. f. 2; Walp. Nep. II. 124 and V. 685.

HAB. Here and there in the eng and low forests, especially on laterite rocks and old pagodas &c., very rare in the upper mixed forests and on pagodas of the plains, all over Pegu, Martaban and Tenasserim as far south as Tavoy.—Fl. Fr. Decb., Jan.

4. *S. BRANDISIANA*, Kurz in Journ. As. Soc. Beng. 1871. 53.

HAB. Upper Tenasserim, Thoungyeen (Dr. Brandis).

5. *S. PICTA*, Korth. Verh. Nat. Gesch. 249. t. 52; Naud. in Ann. d. sc. nat. 3 ser. XV. 26; Bl. Mus. Bot. I. 11; Griff. Not. IV. 676. *teste* Triana; Miq. Fl. Ind. Bat. I. 564.

HAB. Tenasserim, Mergui, on rocks near Palar (Griff.).—Fl. Octob.

6. *S. MACULATA*, Roxb. Fl. Ind. I. 177. (*S. angustifolia*, Roxb. l. c. 178; Wall. Pl. As. rar. II. t. 102).

Var. *α. GENUINA*, all parts sprinkled with hairs; leaves bristly serrulate, usually ovate and equilateral, above elegantly white-blotched.

Var. *β. EMACULATA*, (*S. emaculata*, Roxb. l. c.), as preceding, but the leaves uniformly green.

Var. *γ. ANGUSTIFOLIA*, (*S. angustifolia*, Roxb. l. c. 178), leaves usually acute or acuminate at the very unequal base, not blotched, but often purplish coloured beneath.

HAB. Not unfrequent in shady localities, especially on mossy rocks and along rocky streamlets, in the hill-forests, especially the moister ones, of the Martaban hills and of Tenasserim, at 3000 to 5000 ft. elevation.—Fr. March.

7. *S. SECUNDA*, Wall. Cat. 4094; Benn. Horsf. Pl. Jav. rar. 216; Walp. Rep. V. 685.

HAB. Tenasserim, Tavoy.

8. *S. NUDISCAPA*, Kurz MS.

HAB. Tenasserim, Mergui (Griff. 2303).

9. *S. VIOLEFOLIA*, Hf. in Linn. Trans. XXVIII. 77.

HAB. Tenasserim, Moulmein (Lobb. 356, *teste* Triana).

N. B. *S. Teysmanniana*, Miq. Suppl. Fl. Sumatr. 320 = *S. obliqua*, Korth.

#### **Anplectrum, A. Gray.**

1. *A. CYANOCARPUM*, Triana in Linn. Trans. XXVIII. 84 (*Melastoma cyanocarpum*, Bl. Bydr. 1073; *Dissochæta cyanocarpa*, Bl. Bydr. 743;

Korth. Verh. Nat. Gesch. Bot. 238. t. 56 ; Naud. in Ann. d. sc. nat. 3 ser. XV. 71 ; Miq. Fl. Ind. Bat. I. 522.)

HAB. Rare in the tropical forests of Martaban, east of Tounghoo ; Tenasserim (Helf. 2290).

### *Doubtful Species.*

1. *A. ? barbatum*, Triana in Linn. Trans. XXVIII. 84 (*Melastoma barbatum*, Wall. Cat. 4082).

HAB. Tenasserim, Chappedong (Wall.).

2. *Melastoma cordifolia*, Roxb. Fl. Ind. II. 405.

HAB. Chittagong (Roxb.).

Probably same as *A. cyanocarpum*.

3. *Melastoma curva*, Roxb. Fl. Ind. II. 406.

HAB. Chittagong (Roxb.).

### *Pternandra*, Jack.

#### *Conspectus of Species.*

Flowers in small stout almost simple cymes, ..... *P. capitellata*.

Flowers in branched rather slender axillary and terminal panicles, .... *P. caerulea*.

1. *P. CAPITELLATA*, Jack in Mal. Misc. II. 60 ; Triana in Linn. Trans. XXVIII. 153.

HAB. Tenasserim (or Andamans ?) (Helf. 2279 teste Triana).

2. *P. CAERULEA*, Jack in Mal. Misc. 1822. II. 61 and in Hook. Comp. Bot. Mag. I. 157 ; Triana in Linn. Trans. XXVIII. 153. (*Ewyckia Jackiana*, Walp. Rep. V. 724 ; *Apteuxis trinervis*, Griff. Not. Dicot. 672 ; *Ewyckia paniculata*, Miq. Suppl. Fl. Sumatr. 321).

HAB. Tenasserim (Helf. 2275).

### *Memocylon*, L.

#### *Conspectus of Species.*

*Calyx within without radiate lamella-like nerves, or the nerves very obsolete, (chiefly Hindustani species).*

Leaves sessile or nearly so, opaque, drying yellowish ; cymes sessile, umbel-like ; calyx conspicuously 4-toothed, ..... *M. umbellatum*.

\* \* *Calyx radiately nerved within, the nerves simple or forked, raised and lamella-like like the gills of a mushroom.*

× Berry ovoid or ovoid-oblong. Cymes and pedicels very short and robust.

Leaves sessile or very shortly petioled, with the base rounded or cordate, *M. caeruleum*.

× × Berry globose, the size of a pea to that of a cherry.

\* † Cymes short and sometimes reduced. Leaves usually thick coriaceous, without visible lateral nerves or veins, petioled.

Δ Berries the size of a pea or smaller.

• † Branchlets more or less terete, sometimes marked with obsolete lines.

○ Calyx up to a line in diameter, not tubercled.

Leaves attenuate at the base, very acuminate, glossy; petiole 1—2 lin. long; pedicels hardly a line long, thick; cymes very short, almost sessile, ..... *M. levigatum*.

Leaves attenuate at the base, sharply acuminate; pedicels 1—1½ lin. long; umbel-like cymes shortly peduncled, ..... *M. plebejum*.

O O Calyx about 1½ lin. across, tubercled.

Pedicels short and thick; calyx undulate-truncate with a hemispherical tubercled base; leaves bluntish or retuse, shortly acuminate, ..... *M. punctatum*.

† † Branchlets sharply 4-lined or almost 4-winged and appearing more or less 4-cornered.

Calyx smooth, about 1½ lin. across, expanded, obsolete undulate-lobed; cymes almost sessile or shortly peduncled; leaves as in preceding species, ..... *M. scutellatum*.

Calyx about ½ lin. wide, sharply 4-toothed; leaves only ½—1½ in. long; pedicels about a line long; cymes much reduced, almost sessile, few-flowered, .... *M. pauciflorum*.

Δ Δ Berries the size of a cherry, sappy.

.. *M. cerasiforme*.

+ + Cymes more or less ample, peduncled. Berries the size of a pea or smaller,

+ Leaves rather thin-coriaceous, the lateral nerves more or less conspicuous and arcuately anastomosing towards the margin.

Cymes simple, the pedicels slender; calyx 1—1½ lin. wide. Leaves those of *M. cerasiforme*,  
.. *M. cecastrinum*.

Umbellets in thyrsoid cymes, the pedicels 1—2 lin. long; calyx ¾ lin. wide, the limb sinuate 4-angular, ..... *M. Griffithianum*.

† † Leaves more or less thick-coriaceous, the lateral nerves not or barely visible.

O Leaves sessile, with a cordate base.

Leaves large; cymes lax, peduncled, rather slender: pedicels 2—3 lin. long, slender,  
.. *M. pulchrum*.

O O Leaves petioled, more or less tapering, very rarely rounded, at the base.

Δ Branchlets sharply 4-cornered. Leaves tapering at base.

Cymes rather short-peduncled, but slender; leaves 3—4 in. long, ..... *M. elegans*.

Δ Δ Branchlets terete or with only faint lines.

Leaves attenuate at the base, blunt or retuse, almost opaque when dried; petiole 1—2 lin. long; pedicels ½—1 lin. long, slender; cymes simple, peduncled, ... *M. ovatum*.

Leaves rounded at the base, smooth and shining; petiole 2—4 lin. long; pedicels 2—3 lin. long; cymes simple or compound, peduncled, ..... *M. edule*.

1. *M. UMBELLATUM*, Burm. Thes. Zeyl. t. 31 and Fl. Ind. 87; Bth. Fl. Austr. III. 293; Triana in Linn. Trans. XXVIII. 159; Bedd. Fl. Sylv. t. 206 (*M. tinctorium*, Koen. in Willd. sp. pl. II. 347; Wight III. I. 215. t. 93; *M. ramiflorum*, Lamk. Dict. IV, 88; DC. Prod. XII. 6. *ex parte*).

HAB. In the tropical forests of Boronga island opposite Akyab, Arracan.

2. *M. CÆRULEUM*, Jack in Mal. Misc. I. No. V. 26; Triana in Linn. Trans. XXVIII. 158; Miq. Fl. Ind. Bat. I. 580 (*M. lutescens*, Presl Epim. Bot. 208; *M. Manillanum*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 276; Miq. Fl. Ind. Bat. I. 576).

Var. *α. GENUINA*, berries ellipsoid-oval, nearly 5 lin. long; leaves almost sessile, acute.

Var. *β. FLORIBUNDUM*, (*M. floribundum*, Bl. Mus. Lugd. Bat. I. 361; *M. laurifolium*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 277; Miq. Fl. Ind. Bat. I. 576.), berries ellipsoid-oval, up to 5 lin. long; leaves rounded at the base, usually acute, on a petiole 1—1½ lin. long.

Var. *γ. GRIFFITHIANA*, (*M. cordatum*, Griff. Not. Dicot. 673), berries ellipsoid-globose, about 3—4 lin. in diameter; leaves often retuse or blunt with a mucro, almost sessile.

HAB. Var. *γ.* apparently frequent in Tenasserim, from Moulmein down to Mergui.—Fl. Jul. Aug.; Fr. March.

3. *M. LÆVIGATUM*, Bl. Mus. Bot., I. 358; Miq. Fl. Ind. Bat. I. 576; Triana in Linn. Trans. XXVIII. 157. (*M. pachyderma*, Wall. Cat. 4104).

HAB. Tenasserim (Helf. 2328); ib. Tavoy (Wall. Cat. 4104).—Fr. Octob.

4. *M. PLEBEJUM*, Kurz in Pegu Rep. App. B. 53.

HAB. Not unfrequent in the swamp-forests of the Irrawaddi in Pegu; Upper Tenasserim, Thoungyeen (Brandis); Ava, Bhamo (J. Anderson).

5. *M. PUNCTATUM*, Presl. Bot. Bemerk. 67; Walp. Ann. I. 303.

HAB. Tenasserim (Helf. 2330).

6. *M. SCUTELLATUM*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 282; Triana in Linn. Trans. XXVIII. 157.

Var. *α. SUBSESSILE*, umbellets on peduncles less than a line long or almost sessile; pedicels about a line long; leaves smaller.

Var. *β. BREVI-PEDUNCULATUM*, umbellets on peduncles 1 to 2 lin. long, the pedicels usually 2 lin. long; leaves larger.

HAB. Var. *α.* in the adjoining provinces of Siam; var. *β.* apparently frequent in Tenasserim, from Moulmein southwards; also Pegu, above Rangoon.—Fl. Apr.—June; Fr. Febr.—May.

7. *M. PAUCIFLORUM*, Bl. Mus. Bot. I. 356; Miq. Fl. Ind. Bat. I. 578; Triana in Linn. Trans. XXVIII. 158.

HAB. Not unfrequent in the tropical forests of the Andamans; Tenasserim (Helf. 2332), Amherst (Falconer); Chittagong (Hf. and Th.),—Fl. Beg. of RS.

8. *M. CERASIFORME*, Kurz For. Fl. Burm. I. 516.

HAB. In the forests of Chittagong (Dr. Schlich).—Fr. CS.

9. *M. CELASTRINUM*, Kurz in Pegu Rep. App. B. 53 and For. Fl. Burm. I. 515.

Var. *α. GENUINUM*, leaves glaucous-green, coriaceous; cymes stiff-peduncled.

? Var. *β. BRANDISIANUM*, leaves of a thinner texture, more (often caudately) acuminate; cymes short or very short, simple or the lateral branchings almost reduced; peduncles 2—4 lin. long, pedicels more slender.

HAB. Var. *α.* Not unfrequent in the tropical forests of Martaban, rare in those of the eastern slopes of the Pegu Yomah; var. *β.* in the tropical forests of Upper Tenasserim, (Brandis, Falconer, Helf. 2335).—Fl. Febr.—Apr.; Fr. Jan.

10. *M. GRIFFITHIANUM*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 274. (*M. Horsfieldii*, Miq. in Fl. Ind. Bat. I. 572; *M. Lampongum*, Miq. Suppl. Fl. Sumatr. 321?).

HAB. Tenasserim (Helf. 2331); in the tropical forests of the Martaban hills east of Tounghoo.

11. *M. PULCHRUM*, Kurz in Journ. As. Soc. Beng. 1872. 307.

HAB. Not unfrequent in the tropical forests of the Andamans.—Fl. Begin of May.

12. *M. ELEGANS*, Kurz in Journ. As. Soc. Beng. 1872. 307.

HAB. Rather frequent in the tropical forests of the Andamans.—Fl. May.

13. *M. OVATUM*, Smith in Rees. Cycl. V. 23. No. 3.; DC. Prod. III. 6. (*M. grande*, Wall. Cat. 4109; *M. lucidum*, Presl Epim. Bot. 209; *M. prasinum*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 275).

HAB. Not unfrequent in the tropical forests from Martaban down to Tenasserim; also Chittagong.—Fl. Nov.—Febr.

14. *M. EDULE*, Roxb. Corom. Pl. I. 82; DC. Prod. III. ♀; Triana in Linn. Trans. XXVIII. 158. (*M. edule*, var. *γ.* Thw. En. Zeyl. Pl. 110 and CP. 1563; *M. ramiflorum*, Griff. Not. Dicot. 673).

HAB. Not unfrequent in the tropical forests of the Andamans and the Cocos islands; also Tenasserim (Helf. 2329).—Fl. Apr.—May; Fr. June.

The genus *Memecylon* is in need of a thorough revision. The species are extremely difficult of correct identification without access to the very authentic specimens for the most part deposited in European herbaria and hence inaccessible to the Indian botanist. Triana's account of the genus is barely more than a compilation. I have, therefore, kept the Burmese forms all separate pending a comparison and identification of the same with those already described.

*LYTHRARIÆ.**Conspectus of Species.*

\* Capsule irregularly or circumsciss-dehiscing, or 2-valved, 1—4-celled.

× Seeds glabrous. Leaves not black dotted.

† Flowers with petals, or rarely apetalous in some herbs.

● Herbs. Capsule 1—5-celled, irregularly or transversely dehiscing.

AMMANNIA. Calyx 3—5-toothed. Stamens 2—8. Disk-glands none. Leaves opposite or rarely whorled.

HYDROLYTHRUM. Calyx 4-lobed. Petals 4. Stamens 4. Disk-glands 8. Capsule 2-celled. Aquatics, with whorled leaves.

O O Trees or shrubs.

PEMPHIS. Calyx 12-toothed, ribbed. Petals 6. Stamens 12. Ovary 3-celled. Capsule 1-celled, transversely circumsciss.

LAWSONIA. Calyx 4-parted. Petals 4. Stamens 8. Ovary and capsule 4-celled, the latter irregularly bursting.

† † Flowers apetalous. Trees or shrubs.

CRYPTERONIA. Calyx 4—5-cleft. Stamens 4—5. Ovary and capsule 2-celled, the latter 2-valved.

DICHTOMANTHES. Calyx 5-toothed, terete, the teeth alternating with as many accessory minute ones. Stamens 10. Capsule woody, indehiscent?, 1-celled.

× × Seeds pilose. Calyx-tube tubular, curved. Stamens declinate.

Leaves black-dotted beneath.

WOODFORDIA. Calyx 6-lobed. Petals 6, or none. Stamens 12, long-exserted. Ovary and capsule 2-celled, the latter elongate, sessile, loculicidally 2-valved.

\* \* Capsule regularly opening into 3—8 valves, or berry-like and indehiscent.

Trees or shrubs.

× Capsule dry or leathery, dehiscent.

LAGERSTROMIA. Calyx bell-shaped, 4—6-rarely 7-cleft. Petals 4—6. Stamens numerous, in 2 or more rows. Capsule dry, almost woody, 3—6-celled and -valved. Seeds laterally winged.

DUABANGA. Calyx 4—7-parted, thick coriaceous. Petals 4—7. Stamens numerous, in a single row. Capsule leathery, 4—8-celled and -valved. Seeds appendaged at both ends.

× × Capsule berry-like, indehiscent.

SONNERATIA. Calyx bell-shaped, 4—8-lobed. Petals 4—8, or none. Stamens numerous. Berry many-celled.

*Ammannia, L.**Conspectus of Species.*

*Subg. 1. Rotala, L.* Flowers solitary (rarely and only occasionally by 2 or 3) in the axils of the leaves, or bracts, often forming spikes or racemes. Capsule 2—4-valved.

\* Disk-glands 8 under the ovary. (Hydrolythrum, Hf.).  
Aquatic herb of the habit of *Myriophyllum*, the leaves whorled, linear, . . . *A. Wallichii*.

\* \* Disk-glands absent. (*Rotala, L.*).

× Calyx bell-shaped, thrice as deep as wide. Capsule shorter than, and included in, the calyx-tube.

Leaves very shortly petioled, 1-nerved, linear; flowers solitary, sessile; pygmean annual, ..... *A. dentelloides*.

Leaves usually sessile, strongly penninerved, obovate to oblong; flowers sessile, forming lateral and terminal leafy or bracted spikes, ..... *A. peploides*.

Leaves sessile, almost orbicular, penninerved; flowers shortly and slenderly pedicelled, forming shorter or longer slender racemes, ..... *A. subrotunda*.

Leaves sessile, orbicular or nearly so, penninerved; flowers sessile, in terminal peduncled bracted simple or compound spikes, ..... *A. rotundifolia*.

× × Calyx hemispherical, about as deep as wide; capsule protruded from, or at least as long as, the calyx-tube.

Leaves linear, 1-nerved, very shortly petioled; calyx 4-angular, 4-toothed, about  $\frac{1}{4}$ — $\frac{1}{2}$  lin. long; petals none; pygmean herb, ..... *A. pygmaea*.

Leaves oblong to linear-oblong, 1-nerved, very shortly petioled; calyx short, 4-toothed, about  $\frac{1}{2}$  lin. long; flowers very shortly pedicelled; pygmean herb,

.. *A. simpliciuscula*.

Leaves oblong to linear, sessile, 1-nerved, or the lateral nerves very faint; calyx usually 5-toothed,  $\frac{1}{2}$ —1 lin. long; petals 5, ..... *A. pentandra*.

*Subg. 2. Ammannia*, L. Flowers pedicelled or rarely sessile, axillary, clustered or in cymes, the latter sometimes reduced to 1 or a few flowers only. Capsule irregularly bursting.

× Leaves narrowed at the base, petioled or sessile.

Flowers minute, apetalous, on slender pedicels, forming sessile or very shortly peduncled cymes or clusters, ..... *A. baccifera*.

× × Leaves sessile, with a cordate, sagittate or dilated base. Petals present.

Capsule under a line long; stamens 4, or fewer; petals not crumpled; calyx 4-toothed, without accessory teeth; cymes slender, ..... *A. multiflora*.

Capsule about  $1\frac{1}{2}$  lin. long; stamens 6—8; petals not crumpled; calyx 4-toothed without accessory teeth; cymes slender, ..... *A. auriculata*.

Capsule about 2 lin. long; stamens 8; petals large, crumpled; calyx 4-toothed with as many horn-shaped accessory teeth; cymes and pedicels short, stout, *A. octandra*.

1. *A. WALLICHI*, (*Hydrolythrum Wallichii*, Hf. in Bth. and Hf. Gen. Pl. I. 777, and in Hook. Icon. pl. t. 1007).

HAB. Tenasserim, Tavoy (Gomez).

2. *A. DENTELLOIDES*, Kurz in Journ. As. Soc. Beng. 1870. 76.

HAB. Not unfrequent in wet pastures and rice-fields of Arracan.—Fl. Fr. Sept., Octob.

3. *A. PEPOIDES*, Spreng. Syst. Veg. I. 444 (1825). (*Peplis Indica*, Willd. Sp. pl. II/1. 244; Poir. in Lamk. Enc. V. 162; *A. repens*, Rottl. ex Mart. in Acad. Muench. VI. 150; DC. Prod. III. 80; *Ameletia Indica*, DC. in Mem. Soc. Genev. III/2. 82. t. 3. f. A. and Prod. III. 76; WA. Prod. I. 303; Wight Icon. t. 257. A.; Bl. Mus. Lugd. Bat. I. 135; *Ameletia elongata*, Bl. l. c.; *Ameletia acutidens*, Miq. Fl. Ind. Bat. 1/1. 617; *A. nana*, Roxb. Fl. Ind. I. 427, non DC.).

HAB. Common in wet pastures and fallow rice-fields, along river.

banks, around swamps, &c., all over Burma and the adjoining provinces.—Fl. Fr. Nov.—March.

4. *A. SUBROTUNDA*, Wall. Cat. 2096 ; Kurz in Journ. As. Soc. Beng. 1871. 55.

HAB. Ava, from Segain and Mandalay northwards in the Irrawaddi valley.—Fl. Fr. Jan.

5. *A. ROTUNDIFOLIA*, Buch. in Roxb. Fl. Ind. I. 425 ; DC. Prod. III. 79 ; WA. Prod. I. 306. (*Ameletia rotundifolia*, Wight Ill. I. 206 and Icon. t. 258).

HAB. Ava, Irrawaddi valley about Bhamo &c. ; also Kakhyen hills.—Fl. Febr. March.

6. *A. PYGMÆA*, Kurz in Scem. Journ. Bot. 1867. 376.

HAB. On gravel-roads, sandy grounds &c., of the eng-forests along the western slopes of the Pegu Yomah, and no doubt elsewhere.—Fl. Fr. Nov.

7. *A. SIMPLICIUSCULA*, Kurz in Journ. As. Soc. Beng. 1871. 54.

HAB. On mud around ponds and in rice-fields in Chittagong.—Fl. Fr. Octob.

8. *A. PENTANDRA*, Roxb. Fl. Ind. I. 427 (1820) ; DC. Prod. III. 79, in part ; WA. Prod. I. 305, in part ; Bl. Mus. Lugd. Bat. II. 134. t. 46. f. B. (*Rotala Roxburghiana*, Wight Icon. t. 260. B. ; Walp. Rep. II. 101 ; *Sellowia uliginosa*, Roth. Nov. sp. 163 (1821) ; DC. Prod. III. 380 ; *Tritheca pentandra*, Miq. Fl. Ind. Bat. I/1. 614. ; *A. nana*, DC. Prod. III. 79, non Roxb. ; *Rotala decussata*, DC. l. c. 76).

HAB. Frequent in wet pastures, rice-fields, along river-banks, &c., all over Burma, especially in cultivated lands.—Fl. Fr. Close of RS.

9. *A. BACCIFERA*, L. sp. pl. 175 ; Bl. Mus. Bot. Lugd. Bat. II. 133. (*A. vesicatoria*, Roxb. Fl. Ind. I. 426 ; DC. Prod. III. 78 ; WA. Prod. I. 305 ; *A. Indica*, Lamk. Ill. I. 311. No. 1555 ; DC. Prod. III. 77, in part ; WA. Prod. I. 305, in part ; Bth. Fl. Austr. III. 297 ; Bl. Mus. Lugd. Bat. II. 133. t. 46. f. A : *Cryptotheca apetala*, Bl. Bydr. 1128 ; DC. Prod. III. 76 ; *Hapalocarpum vesicatorium* and *II. Indicum*, Miq. Fl. Ind. Bat. I/1, 618).

HAB. Common in cultivated lands, in fallow rice-fields, on road-sides, along river-banks, lakes, &c., in open as well as in forest-land, all over Burma, up to 2000—3000 ft. elevation.—Fl. Fr. Nov.—May.

10. *A. MULTIFLORA*, Roxb. Fl. Ind. I. 426 ; DC. Prod. III. 79 ; WA. Prod. I. 305. (*Cryptotheca dichotoma*, Bl. Mus. Bot. Lugd. Bat. II. 133. t. 44 ? ; *A. microcarpa*, DC. Prod. III. 78 ? ; *Suffrenia dichotoma*, Miq. Fl. Ind. Bat. I/1, 616).

HAB. Chittagong, in rice-fields and cultivated lands.—Fl. Fr. Octob.

11. *A. AURICULATA*, Willd. Hort. Berol. l. 7. t. 7 ; DC. Prod. III. 80 ; Bth. Fl. Austr. III. 297.

HAB. Chittagong, in rice-fields.—Fl. Fr. Octob.

12. A. OCTANDRA, L. f. Suppl. 127; Roxb. Corom. Pl. II. 18. t. 133 and Fl. Ind. I. 425; WA. Prod. I. 304; Bl. Mus. Lugd. Bat. II. 132. (*Amanella linearis*, Miq. Fl. Ind. Bat. I/1, 619; *Diplostemon octandrum*, Miq. l. c. 615).

HAB. Rice-fields in Chittagong.—Fl. Fr. Octob.

### Pemphis, Forst.

1. P. ACIDULA, Forst. Gen. t. 34; DC. Prod. III. 89; Bl. Mus. Bot. Lugd. Bat. II. 128. t. 43; WA. Prod. I. 307; Griff. Not. Dicot. 510, (*P. angustifolia*, Roxb. Fl. Ind. II. 465; *Mucellandiu Griffithiana*, Wight Icon. t. 1996).

HAB. Rocky coasts all along Tenasserim and Andamans.—Fl. Fr. Octob. and Apr.

### Lawsonia, L.

1. T. INERMIS, L. sp. pl. 498; Roxb. Fl. Ind. II. 258; Griff. Not. Dicot. 509. t. 590. f. 2. (*L. alba*, Lamk. Diet. III. 106; DC. Prod. III. 91; WA. Prod. I. 307; Wight Ill. I. t. 94; *L. spinosa*, L. sp. pl. 498).

HAB. Much cultivated all over Burma, and sometimes like wild around villages and in cleared lands.—Fl. Fr. nearly  $\infty$ .

### Crypteronia, Bl.

#### Conspectus of Species.

Calyx about  $\frac{1}{2}$  lin. across; leaves usually puberulous beneath, ..... *C. pubescens*.

Calyx 1—1 $\frac{1}{2}$  lin. in diameter; leaves quite glabrous, ..... *C. paniculata*.

1. C. PANICULATA, Bl. Bydr. 1151 and Mus. Bot. Lugd. Bat. II. 123. t. 42. (*Henslowia paniculata*, Miq. Fl. Ind. Bat. I/1, 716; *Henslowia affinis*, Planch. in Hook. Lond. Journ. IV. 477; Miq. l. c.).

Var.  $\alpha$ . GLABRA, (*Henslowia glabra*, Planch. in Hook. Lond. Journ. IV. 478; *Crypteronia paniculata*, Bl. l. c.), rhachis of racemes glabrous, at least in fruit.

Var.  $\beta$ . PUBESCENS, (*Henslowia pubescens*, Griff. Not. Dicot. 404. t. 564. f. 2., non Planch.). rhachis of racemes densely puberulous, not glabrescent.

HAB. Var.  $\alpha$ . in Chittagong; var.  $\beta$ . frequent in the tropical forests, especially the open ones, also in the moister upper mixed forests, from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. Nov.—Jan.; Fr. Febr.—May.

### Woodfordia, Salisb.

1. W. FRUTICOSA, (*Lythrum fruticosum*, L. sp. pl. 641; *Woodfordia floribunda*, Salisb. Parad. Lond. t. 42; *Grislea tomentosa*, Roxb. Corom. Pl. I. 29. t. 31. and Fl. Ind. II. 233; Bot. Reg. I. t. 40; Bot.

Mag. t. 1906; DC. Prod. III. 92; WA. Prod. I. 308; Bl. Mus. Lugd. Bat. II. 128).

Var. *a.* *GENUINA*, more or less greyish or silvery appressed pubescent.

Var. *β.* *PUNCTATA*, Bl. Mus. Bot. Lugd. Bat. II. 128 (*Grislea punctata*, Ham. in Rees. Cycl. V. 17. No. 2; DC. Prod. III. 92; WA. Prod. I. 308), leaves shortly petioled, almost glabrous.

HAB. Var. *a.* frequent in the dry forests of the Promo District; rare in the drier upper mixed forests of Pegu; Ava, Kakhyen hills.—Fl. Fr. Jan., Febr.

### *Lagerstrœmia*, L.

#### *Conspectus of Species.*

*Subg.* 1. *Sibia*, DC. Calyx terete, without ribs or furrows.

\* *Inflorescence and calyx glabrous.*

Leaves whitish glaucous beneath; flowers hardly  $\frac{1}{2}$  in. across, ..... *L. parviflora*.

Leaves green; flowers  $1\frac{1}{2}$ —2 in. in diameter, ..... *L. Indica*.

\* \* *Inflorescence and calyx covered with a rusty-coloured tomentum.*

Flowers almost racemose, in panicles, calyx by  $\frac{1}{2}$  or  $\frac{3}{4}$  shorter than the capsule,

... *L. calyculata*.

*Subg.* 2. *Adambea*, Lamk. Calyx furrowed, plaitedly ribbed or angular, the angles acute or almost winged.

\* *Ribs or angles twice as many as calyx-lobes, the shorter alternating ones terminating at the sinuses of the lobes, those of the longer ones extending over the lobes. Petals large.*

+ Inflorescence and calyx covered with a floccose tomentum. Calyx-lobes terminating in a bristle or short mucro.

Adult leaves glabrous, acuminate; tomentum rusty-coloured; petals on short claws, not fringed, ..... *L. floribunda*.

Adult leaves puberulous beneath, acuminate; tomentum whitish or yellowish; petals on long slender claws, ciliolate, ..... *L. tomentosa*.

As preceding, but leaves mucronate or acute; flowers twice as large; petals conspicuously fringed, ..... *L. Loudoni*.

x x Inflorescence and calyx pruinous, or minutely whitish or greyish puberulous, all other parts glabrous.

Leaves whitish glaucous beneath; calyx 10—12-angular, the angles acute, ... *L. hypoleuca*.  
Leaves green; calyx plicately-sulcate, the ribs very obtuse and broader than the furrows, ..... *L. flos-regineæ*.

Leaves green; calyx longitudinally furrowed, without ribs, ..... *L. macrocarpa*.

\* \* *Angles of calyx as many as plain lobes and alternating with them. Petals minute.*

All softer parts greyish pubescent; angles of calyx almost winged; flowers small,

... *L. villosa*.

1. *L. PARVIFLORA*, Roxb. Corom. Pl. I. 28. t. 66. and Fl. Ind. II. 505; Wight Icon. t. 69; Griff. Not. Dicot. 510. t. 592; DC. Prod. III. 93; Bedd. Fl. Sylv. t. 31.

HAB. Ava.—Fl. April.

\*2. *L. INDICA*, L. sp. pl. 734; Bot. Mag. t. 405; Roxb. Fl. Ind. II. 505; WA. Prod. I. 308; Wight Ill. l. t. 86; Bl. Mus. Lugd. Bat. II. 125; Miq. Fl. Ind. Bat. I/1, 622.

HAB. Generally planted in villages, but nowhere wild; (apparently wild in the Yunan-hills).—Fl. May, June.

3. *L. CALYCVLATA*, Kurz in Journ. As. Soc. Beng. 1872. 307.

HAB. Rather rare in the tropical forests of Martaban east of Tounghoo.—Fr. March, April.

4. *L. FLORIBUNDA*, Jack in Mal. Misc. I. 38; DC. Prod. III. 93; Miq. Fl. Ind. Bat. I/1, 624; Bl. Mus. Lugd. Bat. II. 126. t. 41; Griff. Not. Dicot. 509.

HAB. In the tropical forests along the Salween in Martaban and in Tenasserim from Moulmein southwards; also Andamans.—Fl. July, Aug.

5. *L. TOMENTOSA*, Presl Bot. Bemerk. 142; Walp. Ann. I. 295.

HAB. Frequent in the tropical and moister upper mixed forests, all over Pegu and Martaban down to Tenasserim.—Fl. April, May; Fr. May, June.

6. *L. LOUDONI*, Teysm. and Binend. in Natuurk. Tydsch. Ned. Ind. XXIV. 331.

HAB. In the adjoining Siamese province of Kanbooree, in eng-forests.—Fl. HS.

7. *L. HYPOLEUCA*, Kurz in Journ. As. Soc. Beng. 1872. 307.

HAB. Frequent in the tropical and moister upper mixed forests of the Andamans.—Fl. June, July; Fr. CS.

8. *L. FLOS-REGINÆ*, Retz. Obs. Bot. I. 20. (1779). (*L. Reginae*, Roxb. Corom. Pl. I. 46. t. 65. (1795). and Fl. Ind. II. 505; DC. Prod. III. 93; Bl. Mus. Lugd. Bat. II. 126. t. 41; WA. Prod. I. 308; Wight Icon. t. 413; Miq. Fl. Ind. Bat. I/1, 623; Bedd. Fl. Sylv. t. 29; *Adamcea glabra*, Lamk. Encycl. Bot. I. 39. (1783); *Ketmia Indica*, Burm. Thesaur. Zeyl. 137. (1737) non L.).

HAB. Common in the mixed forests and savannahs all over Burmah and the adjacent provinces.—Fl. HS.; Fr. CS.

9. *L. MACROCARPA*, Wall. Cat. 2114; Voigt Hort. Calc. 132.

HAB. Frequent in the open, especially the low, forests, from Ava, Pegu and Martaban down to Tenasserim.—Fl. HS.; Fr. CS.

10. *L. VILLOSA*, Wall. in Journ. As. Soc. Beng. 1873. 234.

HAB. Not unfrequent in the tropical and moister upper mixed forests of the Pegu Yomah and Martaban.—Fl. June.

#### Duabanga, Ham.

1. *D. GRANDIFLORA*, (*Lagerstræmia grandiflora*, Roxb. Hort. Beng. 38 and Fl. Ind. II. 503; DC. Prod. III. 93; Bl. Mus. Lugd. Bat. I.

125; *D. sonneratioides*, Buch. in Linn. Trans. XVII. 178; Hf. Illustr. Him. Pl. t. 11; Walp. Ann. II. 540; *Leptospartion grandiflorum*, Griff. Not. Dicot. 511. t. 591).

HAB. Frequent in the mixed forests, especially the upper ones, also in the tropical forests, all over Burmah, from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. March, April; Fr. May.

### Sonneratia, L. f.

#### Conspectus of Species.

\* *Stigma infundibuliform-capitate, small.*

× Petals linear-lanceolate, dark purple.

Calyx terete, 6—8-lobed; leaves obovate, broad, ..... *S. acida*.

× × Petals none.

Calyx in bud elliptically oblong, acute, the tube at first obscurely, then strongly 6—8-angular, ..... *S. alba*.

Calyx in bud ovoid, obtuse, the tube terete, ..... *S. Griffithii*.

\* \* *Stigma large, nearly 3 lin. in diameter, conically umbrella-shaped.*

Calyx 4-lobed; petals none; leaves oblong to lanceolate, ..... *S. apetala*.

1. *S. ACIDA*, L. f. Suppl. 252; DC. Prod. III. 235; Roxb. Fl. Ind. II. 506; WA. Prod. I. 327; Wight Icon. t. 340; Griff. Not. Dicot. 652; Miq. Fl. Ind. Bat. I/1, 496.

HAB. Frequent in the littoral forests all along the coasts, from Chittagong down to Tenasserim and the Andamans.—Fl. H. and RS.; Fr. CS.

2. *S. ALBA*, Smith in Rees Cycl. V. 23; DC. Prod. III. 231; Miq. Fl. Ind. Bat. I/1, 497. (*Mangium album*, Rumph. Herb. Amb. III. 111. t. 73).

HAB. On the sea-shore of the Andamans.—Fl. April, May.

3. *S. GRIFFITHII*, Kurz in Journ. As. Soc. Beng. 1871. 56. (*S. alba*, Griff. Not. Dicot. 652.)

HAB. Frequent in the littoral, especially the tidal forests of Pegu and Tenasserim.—Fl. April, May.

4. *S. APETALA*, Buch. in Sym. Emb. to Ava III. 313. t. 25; DC. Prod. III. 231; WA. Prod. I. 327; Roxb. Fl. Ind. II. 506; Griff. Not. Dicot. 650. t. 636. f. 4.

HAB. Common in the tidal forests, less so in the mangrove swamps, all along the coasts from Chittagong down to Tenasserim; Ava (Mrs. Burney) is there no mistake?—Fl. June, July; Fr. RS.

### GRANATEÆ.

#### Punica, L.

*P. GRANATUM*, L. sp. pl. 676; DC. Prod. III. 3; WA. Prod. I. 327; Roxb. Fl. Ind. II. 409; Bot. Mag. t. 1832. AB.; Wight Illustr. II. 497; Griff. Not. Dicot. 641. t. 634.

HAB. Ava, much planted from Mandalay northwards.—Fl. Jan., Febr.

### ONAGRARIÆ.

#### Conspectus of Species.

- \* Ovary 2—6-celled, the cells many-ovuled. Capsules dehiscing loculicidally or septicially, many-seeded. Usually terrestrial herbs.

JUSSLEA. Stamens twice as many as petals. Ovary 4-celled. Capsule septicial.

LUDWIGIA. Stamens as many as petals. Ovary 3—6-celled. Capsule septicial.

- \*\* Ovary 1—4-celled, the cells 1-(rarely 2—4-) ovuled. Nut 1—4-celled, 1—4-seeded.

TRAPA. Flowers 4-merous. Ovary 2-celled. Nuts with 2 or 4 spines or horns. Floating herbs.

### Jussiaea, L.

#### Conspectus of Species.

Creeping or floating herb; flowers usually 5-merous, white, long-pedicelled; seeds large, spongy, ..... *J. repens*.  
Erect, terrestrial; flowers mostly 4-merous, very shortly pedicelled or almost sessile; seeds minute, crustaceous, glossy, ..... *J. suffruticosa*.

1. *J. REPENS*, L. sp. pl. 550 and Mant. 381; DC. Prod. III. 54; WA. Prod. I. 335; Roxb. Fl. Ind. II. 401; Rheed. Hort. Malab. II. t. 51. (*J. Swartziana*, DC. l. c.; *J. floribunda*, Griff. Not. Dicot. 680).

Var. *a. GLABRIUSCULA*, all parts more or less glabrous; peduncles smooth; ovary puberulous or almost glabrous.

Var. *β. VESTITA*, all parts, more especially the peduncles, more or less softly hairy or pubescent; ovary more or less woolly.

HAB. Both forms frequent in and around ponds, lakes, swamps, &c., also in rice-fields and quietly running streams, all over Burma down to Tenasserim.—Fl. Jan. to April; Fr. April, May.

2. *J. SUFFRUTICOSA*, L. sp. pl. 555; Miq. Fl. Ind. Bat. I/1, 628; Bth. Fl. Austr. III. 307.

Var. *a. GENUINA*, (*J. angustifolia*, Lamk. Dicot. III. 331 and III. t. 280. f. 3; DC. Prod. III. 55; *J. exaltata*, Roxb. Fl. Ind. II. 401; *J. suffruticosa*, L. l. c.; *J. Blumeana*, DC. Prod. III. 331; Miq. Fl. Ind. Bat. I/1, 627; *J. longipes*, Griff. Not. Dicot. 689; *J. Burmanni*, DC. l. c. 57), all parts simply appressed pubescent or almost glabrous, the capsules narrower.

Var. *β. VILLOSA*, Miq. Fl. Ind. Bat. I/1, 628 (*J. villosa*, Lamk. Encycl. Méth. III. 331; DC. Prod. III. 57; WA. Prod. I. 336; *J. fruticosa*, DC. l. c.; Rheed. Hort. Malab. II. t. 50.), all parts more densely villous, the capsules usually thicker and more pubescent.

HAB. Both varieties common on mud-banks of rivers, around tanks, in swamps and rice-fields, &c., all over Burma down to Tenasserim.—Fl. Fr. March—May.

**Ludwigia, L.***Conspectus of Species.*

Capsules from oblong to elongate-cylindrical, thick; seeds densely covering the placentas, ..... *L. parviflora*.

Capsules almost filiform; seeds in a single row, ..... *L. prostrata*.

1. *L. PARVIFLORA*, Roxb. Fl. Ind. I. 419; Schlechtd. in Coroll. Obs. Hort. Hal. 1854 and in Linn. XXVI. 479; Wight Ill. t. 101; WA. Prod. I. 336; DC. Prod. III. 59. (*L. perennis*, Miq. Fl. Ind. Bat. I/1, 629, non L.; *L. gracilis*, Miq. l. c.).

Var. *α*. ROXBURGHIANA, (*L. parviflora*, Roxb. l. c., &c.) capsules sessile or nearly so; 4—6 in. long; calyx-lobes only half as long as the calyx-tube.

Var. *β*. LYTHROIDES, (*L. lythroides*, Bl. Bydr. 1134; DC. Prod. III. 59), capsules distinctly pedicelled, from obovate to almost turbinate or oblong, about 2—3 lin. long; calyx-lobes as long as the calyx-tube.

HAB. Var. *α*. here and there in Pegu and Martaban, along the larger rivers, as the Sittang &c.; var. *β*. frequent on mud-banks, in swampy places and rice-fields, around tanks and lakes, &c., all over Burma down to Tenasserim and the Andamans.—Fl. Fr. Sept.—May.

2. *L. PROSTRATA*, Roxb. Fl. Ind. I. 420; DC. Prod. III. 59; Wight Icon. t. 762. (*L. diffusa*, Ham. in Linn. Trans. XIV. 301; DC. l. c.; *Nematopyxis fruticulosa*, *pusilla* and *prostrata*, Miq. Fl. Ind. Bat. I/1. 630).

Var. *α*. LUXURIANS, plant erect and branched, the leaves much larger.

Var. *β*. HUMIFUSA, small, prostrate; leaves small, usually not above  $\frac{1}{2}$  in. long, more or less blunt.

HAB. Var. *α*. not unfrequent in wet places in Pegu and the Andamans; also Ava; var. *β*. on wet sand-banks of rivers, as the Toukyeghat river.—Fl. Fl. H. and R.S.

**Trapa, L.***Conspectus of Species.*

Nut with 2 opposite reflexed bearded spines, ..... *T. bispinosa*.

Nut with 2 pairs of opposite spines, ..... *T. quadri-spinosa*.

1. *T. BISPINOSA*, Roxb. Corom. Pl. III. t. 234 and Fl. Ind. I. 428; DC. Prod. III. 64; WA. Prod. I. 337; Rheed. Hort. Malab. XI. t. 33; Miq. Fl. Ind. Bat. I/1. 636).

HAB. In tanks of Chittagong; also Ava.

**SAMYDACEÆ.***Conspectus of Species.*

*Typ. I. CASEARIÆÆ.* Calyx free, 5- or 4-merous. Petals none. Stamens 6—30, inserted in a single row to the calyx-tube, usually alternating with as many stamens.

**GUIDONIA.** Stamens 6—15, alternating with as many short staminodes. Flowers clustered or in corymbs.

**Trib. II. HOMALIEÆ.** Calyx free or adnate to the ovary, 4—15-merous. Petals as many. Stamens 4—15, or if more arranged in clusters, but always opposite the petals.

**HOMALIUM.** Petals as many as sepals. Ovary more or less adnate to the ovary and inferior.

### **Guidonia, Plum.**

(*Casearia*, Jacq.)

#### **Conspectus of Species.**

\* *Filaments very slender, many times longer than the anthers.*

† Stamens and staminodes 8 each, separately inserted.

All parts glabrous; leaves coarsely crenate; flowers about 2 lin. across; pedicels and calyx glabrous, ..... *G. Canziana*.

Young shoots, calyx, and pedicels, and also often the nerves beneath of the serrulate leaves, puberulous; flowers only a line across, ..... *G. glomerata*.

† † Stamens and staminodes 8 each, united at the base and forming a broad disk round the ovary.

All parts, also the flowers and pedicels, more or less tomentose or puberulous, .. *G. tomentosa*.

\* \* *Filaments only as long as the anthers.*

All parts more or less puberulous; stamens 8, ..... *G. Vareca*.

1. *G. CANZIANA* (*Casearia Canziana*, Wall. ap. Voigt Hort. Calc. 78; *Casearia ovata*, Roxb. Fl. Ind. II. 428, non Willd.).

**HAB.** Frequent in the mixed forests, especially the lower ones, all over Pegu and Martaban.

*Casearia Hamiltonii*, Wall. Cat. differs in the crenate leaves, and in the number (10) of the stamens and staminodes.

2. *G. GLOMERATA*, (*Casearia glomerata*, Roxb. Fl. Ind. II. 419; DC. Prod. II. 49).

**Var. α. GLABRIUSCULA**, leaves almost glabrous.

**Var. β. PUBERULA**, leaves beneath on the nerves, the petioles &c., puberulous.

**HAB. Var. β.** Chittagong (Hf. and Th.).

3. *G. VARECA*, Baill. (*Casearia Vareca*, Roxb. Fl. Ind. II. 418; *C. Vareca*, Gærtn. Fr. I. t. 60).

**HAB.** Ava, Khakyen hills east of Bhamo (J. Anderson).—Fr. Apr.

### **Homalium, Jacq.**

#### **Conspectus of Species.**

\* *Stamens solitary and opposite to the petals. Flowers racemose or spiked, often collected into panicles.*

× Flowers about 2 lin. in diameter. Ovary villous.

Leaves coriaceous, tomentose or puberulous beneath; flowers tomentose, sessile; spikes robust, tomentose, ..... *H. tomentosa*.

Leaves thin chartaceous, pubescent on the nerves; flowers tomentose, shortly pedicelled; racemes pubescent, slender,..... *H. Griffithianum*.

× × Flowers less than a line in diameter. Spikes collected into panicles.

All parts, also the spikes, quite glabrous; flowers sessile; ovary villous,

... *H. minutiflorum*.

\* \* Stamens by 2 or more opposite to the petals.

Quite like *H. Nepalense*, but stamens by threes; ovary tomentose; flowers longish pedicelled, in divaricate terminal glabrous panicles, ..... *H. Schlichii*.

Glabrous; stamens by twos; ovary glabrous; racemes slender, glabrous, .. *H. fœtidum*.

1. *H. TOMENTOSUM*, Bth. in Linn. Proc. IV. 34. (*Blackwellia tomentosa*, Vent. Choix. t. 57; DC. Prod. II. 55; *Blackwellia spiralis*, Wall. in As. Research. XIII. 400 c. tab.; DC. Prodr. I. c.).

HAB. Frequent in the mixed forests all over Pegu, Arracan, and Martaban, up to 2000 ft. elevation.—Fl. Fr. Nov.—Jan.

2. *H. GRIFFITHIANUM*, Kurz in Journ. As. Soc. Beng. 1871. 57. (*Blackwellia* sp., Griff. Not. Dicot. 584. t. 585. A. f. 10; *Blackwellia dasyantha*, Turcz. in Bull. d. Nat. Mosc. 1863. 610).

HAB. Tenasserim, Mergui (Griff. 991).

This may possibly be *Astranthus Cochinchinensis*, Lour., Fl. Coch. 225 (= *Blackwellia*—Bl. Mus. Bot. II. 27).

3. *H. MINUTIFLORUM*, Kurz in Journ. As. Soc. Beng. 1827. 308.

HAB. Burma, probably Martaban or Tenasserim (Brandis).

Habit of *H. fœtidum*, but the flowers very minute.

4. *H. SCHLICHII*, Kurz, For. Fl. Burm. I. 532.

HAB. Forests of Chittagong (Dr. Schlich) Fl. CS.

5. *H. FÆTIDUM*, Bth. in Linn. Proc. IV. 37.—(*Blackwellia fœtida*, Wall.; Deless. Icon. III. 32. t. 53; *Ludia fœtida*, Roxb. Fl. Ind. II. 508).

HAB. Tenasserim, Mergui (Griff. teste Benth.).

## TURNERACEÆ.

### Turnera, L.

\*1. *T. ULMIFOLIA*, L. sp. pl. 965 and Hort. Cliff. 122. t. 10.; DC. Prod. III. 346 (*T. angustifolia*, Curt. Bot. Mag. t. 281).

HAB. Disseminated from gardens and now often growing as wild in rubbishy places around the larger villages and towns, as Rangoon, Akyab, &c., Fl. Fr. CS.

## PASSIFLOREÆ.

### Conspectus of Genera.

Subord. I. *PASSIFLOREÆ*. Flowers hermaphrodite, or rarely unisexual and in this case the male and female corollas conform. Corona conspicuous, simple or double.

**Tribe 1. PASSIFLOREÆ.** Corona of the corolla simple or double and usually conspicuous. Petals usually herbaceous or coriaceous, rarely none.

**PASSIFLORA.** Calyx-tube short. Petals 4—5, rarely none. Stamens 4—5. Styles 3. Leaves simple.

**Subord. II. PAPAYACEÆ.** Flowers hermaphrodite or unisexual. Stamens perigynous. Corona small or none.

**Tribe 2. MODECCEÆ.** Flowers hermaphrodite, or, if unisexual, the male and female corollas conform. Corona small or none. Petals usually included in the calyx-tube. Connective often produced beyond the anther-cells.

**MODECCA.** Flowers unisexual. Calyx 5-cleft. Corona none or fringed. Disk-glands 5. Tendril-bearing herbs or shrubs.

**Tribe 3. PAPAYAEÆ.** Flower unisexual, the male and female corollas dissimilar, rarely polygamous. Corona none. Calyx minute. Male corolla tubular, the female one 5-petalled. Stamens in two rows, inserted to the corolla-tube. Erect trees, with milky juice.

**CARICA.** Filaments free. Leaves simple, lobed or cut.

### Passiflora, L.

#### Conspectus of Species.

**Subg. 1. Granadilla, DC.** Involucre 3-leaved, the leaflets entire or toothed, or dissected. Sepals and petals 5 each. Peduncles 1-flowered, arising together with the simple tendrils from the same leaf-axil.

\* *Involucre-leaflets entire or toothed.*

Branches and branchlets wingedly 4-cornered; stipules and bracts entire; petiole with 4—6 glands; leaves entire, ..... *P. quadrangularis*.

Branches &c., almost terete or slightly angular, never winged; stipules setaceous, long; bracts obovate, glandular-serrate at the tips; petiole 2-glanded at the apex; leaves entire, ..... *P. laurifolia*.

\* *Involucre-leaflets pinnatifid-cut, the end-segments capillary or setaceous, glandular-thickened at the apex* (Dyosmia, DC.)

All parts hairy; leaves 3-lobed, the petiole gland-less, ..... *P. foetida*.

**Subg. 2. Eu-Passiflora.** Flowers not involucred, the bracts remote, large, small or absent. Corona membranous, sharply folded, frilled at the edge.

\* *Flowers bracted, the bracts small. Petals present.* (Decaloba, Endl.)

† Leaves lobed, velvety beneath.

Exactly as *P. Horsfieldii*, but leaves deeply 3-lobed and smaller, the lobes blunt,

... *P. caloneura*.

† † Leaves entire, glabrous.

Flowers small; petiole 1—2 in. long, 2-glanded at or about the middle; leaves glaucous beneath, acuminate, ..... *P. Nepalensis*.

\* *Flowers apetalous, usually without bracts* (Cieca, Mod.).

Flowers small; petiole  $\frac{1}{4}$ — $\frac{1}{2}$  in. long, 2-glanded at the apex; leaves acute, *P. suberosa*.

1. *P. FOETIDA*, Cav. Diss. 10. t. 289; DC. Prod. III. 331; Bot. Reg. t. 321; Bot. Mag. t. 2619.

**HAB.** Frequent in the more cultivated parts, especially in hedges, waste-places, and savannahs, of Chittagong and Ava to Arracan and Pegu.—Fl. Fr. Aug.—Jan.

**N. B.** *P. laurifolia*, L. (Bot. Reg. t. 13) and *P. quadrangularis*,

L. (Bot. Reg. t. 14; Bot. Mag. t. 2041) are frequently cultivated in gardens in Burma, and sometimes half-wild.

2. *P. CALONEURA*, Kurz MS.

HAB. Burma, probably Upper-Tenasserim or Martaban (Dr. Brandis).

The texture, nervature, and indument of the leaves are entirely those of *P. Horsfieldii*. Flowers and fruits unknown.

3. *P. SUBEROSA*, L. Amæn. Acad. I. 226; Mast. in Linn. Trans. XXVII. 630 (*P. Walkeriæ*, Wight Ill. t. 108.)

HAB. In hedges and in shrubbery of Chittagong.—Fl. Fr. RS.

### **Modecca, Lamk.**

#### *Conspectus of Species.*

\* *Petals inserted at the throat or to the tube of the calyx; stigmas sessile* (*Microblepharis*, Wight).

Leaves entire; seeds pitted, with crenate borders, ..... *M. cordifolia*.

\* \* *Petals inserted on the bottom of the calyx. Style 3-cleft or styles 3, distinct.* (*Blepharanthus*, Wight).

Leaves 3- rarely 5-lobed; seeds pitted, with a doubled-crenate border, .... *M. trilobata*.

1. *M. CORDIFOLIA*, Bl. Bydr. 939; Rumph. I. 169. t. 49; Miq. Fl. Ind. Bat. I. 702.

HAB. Not unfrequent in open places of the tropical forests, especially along the coasts, of the Andamans.—Fl. Fr. April, May.

2. *M. TRILOBATA*, Roxb. Corom. Pl. III. t. 271 and Fl. Ind. III. 132.

HAB. Frequent in the tropical and moister mixed forests, especially in open places, but also in village-bushes, in hedges, along river-sides, &c. all over Burma, from Chittagong and Ava southwards.—Fl. Begin. of RS. Fr. end of RS.

### **Carica, L.**

\*1. *C. PAPAYA*, L. sp. pl. 1466; Roxb. Fl. Ind. III. 824; WA. Prod. I. 352; Bot. Reg. t. 459; Bot. Mag. t. 2898 and 2899; Griff. Not. Dicot. 570. t. 584. f. 2; Wight Ill. II. t. 106, 107; Maingay in Journ. Agr. Hort. Soc. India 1867. 184 cum icon. (*Papaya vulgaris*, DC. Prod. XV[1. 414).

HAB. Generally cultivated all over Burma, especially the southern provinces where it often springs up half-spontaneously in uncultivated places and along river-banks.—Fl. Fr. nearly ∞.

### **CUCURBITACEÆ.**

#### *Conspectus of Genera.*

*Trib. I. CUCURBITACEÆ*, Endl. Anthers 2-celled, the cells straight, curved or flexuose. Ovary with 3 (rarely 2 or 5) placentas; ovules horizontal, numerous.

*Anther-cells flexuose or folded up (very rarely straight or only curved.)*

× Corolla rotate or bell-shaped, 5-petalled or 5-parted to the base. Filaments usually free.

+ Petals cirriferous or fringed.

HODGSONIA. Ovules 12, in pairs attached to each side of the 2 parietal-placentas. Seeds large, united by pairs. Leaves lobed, coriaceous.

TRICHOSANTHES. Ovules and seeds very numerous, the later variously shaped, small or large. Petals fringed or rarely entire or nearly so, white. Leaves entire or lobed.

+ + Petals entire.

† Calyx-tube of males elongate. Stamens inserted in the calyx-tube, included, the anthers cohering into an oblong head.

GYMNOFETALUM. Stigmatic lobes of female flowers linear, simple. Tendril simple. Fruit small, pulpy within. Corolla yellow.

LAGENARIA. Stigmatic lobes of female flowers 2-lobed. Tendrils 2-cleft. Fruit with a woody rind. Petiole 2-glanded at the apex.

† † Male calyx-tube short (very rarely long). Stamens inserted at the mouth or in the tube of the calyx, usually exerted, the anthers free or slightly cohering.

O Stamens inserted at the mouth of the calyx; filaments exerted, recurved; anthers free, the cells bordering the broad connective.

LUFFA. Male flowers racemose. Fruit dry, with a woody-fibrose endocarp, dehiscing by an apical circumsciss opercle. Petiole without glands.

BENINCASA. Male and female flowers solitary. Fruit fleshy, berry-like, pulpy inside. Tendrils 2—3-cleft. Petiole without glands.

O O Stamens inserted below the mouth of the calyx; anthers conniving or cohering.

‡ Calyx furnished with 1—3 scales at the bottom.

MOMORDICA. Calyx with 2 or 3 scales. Male flowers usually furnished with a large complicate bract subtending the pedicel. Tendrils simple.

THLADIANTHA. Calyx with a single scale. Bracts of male flowers dimorphous, the inner ones smaller and imperfect.

‡ ‡ Calyx without scales.

CUCUMIS. Connective produced beyond the anther-cells. Tendrils simple.

CITRULLUS. Connective not prolonged. Stigmas reniform. Tendrils usually 2—3-cleft.

× × Corolla bell-shaped, 5-lobed to the middle or somewhat further down.

CEPHALANDRA. Male flowers solitary or nearly cymose. Stigmas narrow, 2-lobed or -parted. Tendrils simple.

CUCURBITA. Flowers solitary. Calyx-lobes spreading. Filaments free. Stigmas 3, 2-lobed or 2-forked. Tendrils usually 2- or more-cleft.

\* \* *Anther-cells straight or curved, not flexuose.*

× Style inserted on a cupular or annular disk.

BRYONIA. Male flowers racemose or clustered. Filaments short, the connective not produced. Berry spherical, shortly peduncled.

MUCKIA. Male flowers solitary or clustered. Calyx bell-shaped. Connective produced beyond the anther-cells. Berry spherical, sessile. Seeds scrobiculate.

**ZEHNERIA.** Male flowers usually corymboso. Filaments elongate; anthers orbicular, the connective not produced, villous on the back. Berry shortly peduncled.

**MELOTHRIA.** Male flowers usually racemose. Anthers almost sessile, the connective produced beyond the anther-cells and usually 2-lobed. Berry usually long- and slender-peduncled.

× × Disk at the base of the style absent or obsolete.

**RHYNCHOCARPA.** Ovary with 1—3 placentas. Berry few-seeded, beaked. Connective produced beyond the anther-cells.

**CTENOLEPIS.** Calyx-tube short, the lobes subulate. Ovary with 2 or 3 placentas. Fruit oblique, few-seeded. Seeds concave-convex. Petiole furnished with a basilar pectinate leaflet. Connective not produced.

**Trib. II. CREMOSPERMÆ.** Anthers 1-celled. Ovary 1- or 3-celled; ovules 2 to many, suspended.

\* Seeds not winged.

**Subtrib. 1. GYNOSTEMMÆ.** Stamens 3 or 5, the filaments free or united. Ovary 3-celled, with 1 or 2 pendulous ovules in each cell.

**GYNOSTEMMA.** Petals lanceolate. Stamens 5, the filaments united. Berry globular. Leaves pedately 5-foliolate.

**Subtrib. 2. GOMPHOGYNÆ.** Stamens 5; filaments free. Ovary 1-celled, with 2—6 ovules suspended from, or near, the summit of the cell.

**ACTINOSTEMMA.** Petals caudate-acuminate. Fruit almost globose, dehiscent by an apical opercle. Leaves hastate-cordate.

**GOMPHOGYNE.** Petals oblong, erose. Fruit turbinate, broadly 3-angular and 3-valved at the apex. Leaves pedately 5—7-foliolate.

\* \* Seeds winged.

**Subtrib. 3. ZINONJÆ.** Stamens 5; filaments free; anthers oblong. Ovary 1-celled, with 3 thick parietal placentas; ovules numerous. Fruit dry, 1-celled, with a broad open 3-angular mouth at the top.

**ALBOMYRA.** Calyx-lobes 5. Stamens 4, perfect. Styles 3, the stigmas 2-lobed. Leaves 3-foliolate.

**ZANONIA.** Calyx-lobes 3. Styles 3, 2-cleft. Leaves simple.

### Hodgsonia, Hf. and Th.

1. **H. HETEROCLITA**, Hf. and Th. in Linn. Proc. Nov. 1853; Hf. Ill. Him. Pl. t. 1—3; Fl. d. serr. t. 1262-63; (*Trichosanthes heteroclita*, Roxb. Fl. Ind. III. 705).

**HAB.** Not unfrequent in the tropical forests, especially along choungs, of the eastern slopes of the Pegu Yomah, and in Martaban, up to 2000 ft. elevation; also Chittagong.—Fl. Fr. March, April.

### Trichosanthes, L.

#### Conspectus of Species.

**Subg. 1. Eu-Trichosanthes.** Petals conspicuously fringed. Male flowers racemose.

\* Male racemes without or with minute bracts, the bracts hardly a line long and inconspicuous. Seeds imbedded in a red or yellowish pulp, grooved or tubercled, with thickened crenate or waved margins.

- × Leaves more or less deeply palmately lobed.
- + Male racemes without bracts.

Fringes of the petals simple and straight; fruits ovate, acuminate; margin of seeds thickened and crenate, ..... *T. cucumerina*.

- + + Male racemes minutely bracted.

Fringes of petals simple, curled; fruits elongate, spindle-shaped, ..... *T. anguina*.

Fringes of petals jagged; fruits oblong, acuminate; seeds thick and irregularly tubercled, ..... *T. lobata*.

- × × Leaves cordate, not lobed.

Leaves pubescent; seeds with a central longitudinal ribbon, the lateral lobes truncate,

.. *T. reniformis*.

- \* \* Male racemes conspicuously bracted, the bracts leafy, 3 lin. to 1½ in. long and longer. Seeds imbedded in a dirty dark-green pulp, smooth, with entire margins. (Involucraria, Sering.)

Petals fringed with very long simple curled cilia; bracts of male flowers large and broad, 1—1½ in. long; calyx-lobes lanceolate, entire; leaves usually palmately and very deeply lobed; fruits large, oval-oblong, compressed,

.. *T. grandibracteata*.

Fringes of petals very long and simple; bracts of male flowers usually smaller; calyx-lobes broadly ovate, serrate; leaves angular or palmately lobed; fruits globose,

.. *T. bracteata*.

Petals to near their middle cut into numerous jagged segments, not fringed; female flowers not tubular; fruits globose; leaves cordate, usually not lobed, *T. cordata*.

As preceding but leaves larger and slightly angular, the tube of the female flowers 1½ in. long, ..... *T. macrosiphon*.

*Subg. 2. Pseudo-Trichosanthes.* Flowers dioecious, of both sexes solitary in the leaf-axils, the female ones very shortly peduncled or almost sessile, the males on slender pedicels.

- \* Petals with very long curled branched fringes.

Leaves cordate, not lobed; fruits oblong; seeds almost globular, ..... *T. dioica*.

- \* \* Corolla-lobes entire or only slightly lacrate.

Leaves reniform; fruits globular or nearly so; seeds elliptically oblong,

.. *T. integrifolia*.

\*1. *T. CUCUMERINA*, L. sp. pl. 1432; DC. Prod. III. 315; Roxb. Fl. Ind. III. 702; Miq. Fl. Ind. Bat. I/1. 676; Naud. in Ann. d. sc. nat. 4 ser. XVIII. 191; Bth. Fl. Austr. III. 314.

HAB. Generally cultivated all over Burma, especially in the plains, and sometimes half wild along the larger rivers in cultivated lands, in hedges, around villages, &c.—Fl. Fr. Sept.—Jan.

2. *T. LOBATA*, Roxb. Fl. Ind. III. 703.

HAB. Here and there in hedges near Chittagong.—Fl. Fr. CS.

\*3. *T. ANGUINA*, L. sp. pl. 1430; Bot. Mag. t. 722; DC. Prod. III. 314; Naud. in Ann. d. sc. nat. 4th ser. XVIII. 190; WA. Procl. I. 350; Miq. Fl. Ind. Bat. I/1. 678; Bot. Mag. t. 722. (*Petola anguina*, Rumph. Herb. Amb. V. t. 148; *T. colubrina*, Jacq. Ecl. t. 128; DC. l. c.).

HAB. Burma, cultivated (according to Dr. Mason).

4. *T. RENTIFORMIS*, Miq. Fl. Ind. Bat. I/1. 675 ; Kurz in Journ. As. Soc. Beng. 1871. 57.

HAB. Andamans, in open places of the forests on Rutland island.

5. *T. BRACTEATA*, Voigt Cat. Hort. Calc. 58. (*Modecca bracteata*, Lamk. Encyl. Meth. IV. 210 ; DC. Prod. III. 337 ; *T. palmata*, Roxb. Fl. Ind. III. 704 ; WA. Prod. I. 350 ; Wight Ill. II. t. 104, 105.)

HAB. Frequent in all mixed forests, amongst shrubbery and in bushes along rivers, in hedges, &c., also in the savannahs, all over Burma as far down as Tenasserim and the Andamans.—Fl. May—Octob. ; Fr. April, May.

6. *T. GRANDIBRACTEATA*, Kurz MS.

HAB. Ava, along the Irrawaddi northwards from Mandalay ; also Khakyen-hills east of Bhamo.—Fl. July.

7. *T. CORDATA*, Roxb. Fl. Ind. III. 703.

HAB. Not unfrequent in the savannahs and in the savannah-forests along the Sittang in Pegu.—Fl. May, June.

8. *T. MACROSLAPHOX*, Kurz in Journ. As. Soc. Beng. 1872. 308.

HAB. Upper Tenasserim, Attaran (Dr. Brandis).

9. *T. INTEGRIFOLIA*, (*Cucumis integrifolius*, Roxb. Fl. Ind. III. 724 ; *Gymnopetalum integrifolium*, Kurz in Journ. As. Soc. Beng. 1871. 58).

HAB. Frequent along the banks of rivers and choungs all over Pegu and Martaban ; also Ava.—Fl. Febr.—April ; Fr. May.

### *Gymnopetalum*, Arn.

#### *Conspectus of Species.*

*Subg. 1. Eu-Gymnopetalum.* Dioecious. Male flowers in long-peduncled racemes, destitute of bracts. Fruits not ribbed. Flowers yellow.

*Subg. 2. Scotanthus*, Naud. Monœcious. Male flowers in bracted racemes. Fruit ribbed. Flowers white.

Leaves cordate, 3—5-angular ; female flowers long-peduncled ; fruits ovoid,

.. *G. Cochinchinensis*.

Leaves palmately and deeply 3—5-lobed, the lobes blunt ; fruits clavate-cylindrical,

.. *G. heterophyllum*.

1. *G. COCHINCHINENSE*, Kurz in Journ. As. Soc. 1871. 57. (*Bryonia Cochinchinensis*, Lour. Flor. Coch. 595 ; DC. Prod. III. 305 ; *Momordica tubiflora*, Roxb. Fl. Ind. III. 711 ; *Scotanthus tubiflorus*, Naud. in Ann. d. sc. nat. 4 ser. XVI. 173. t. 3).

HAB. Not unfrequent in cultivated and rubbishy places in Chittagong and Aracan ; Ava ; Tenasserim.—Fl. Fr. Octob.

2. *G. HETEROPHYLLUM*, Kurz in Trim. Journ. Bot. 1875. 326.

HAB. Frequent in the tropical and moister upper mixed forests, especially on damp rocks and tree-stems along choungs, from Martaban down to Tenasserim and the Andamans.—Fl. Fr. Febr., March.

May possibly be an obtuse-lobed and smaller bracted form of *G. quinquelobum*, Miq. Fl. Ind. Bat. I/1. 681.

### Lagenaria, Ser.

\*1. *L. VULGARIS*, Ser. in DC. Prod. III. 299; WA. Prod. I. 341; Wight Ill. t. 105/bis f. 7; Miq. Fl. Ind. Bat. I/1. 669. (*Cucurbita Lagenaria*, L. sp. pl. 1434; Roxb. Fl. Ind. III. 718; Rheed. Hort. Malab. VIII. t. 1. 4. 5; Rumph. Herb. Amb. V. 393. t. 144; *L. idolatrica*, Ser. in DC. l. c.; Miq. l. c.).

Var. *a. VULGARIS*, all parts softly, but not viscidly, pubescent; fruits flask-shaped.

Var. *β. IDOLATRICA*, (*L. idolatrica*, Ser. l. c.), all parts viscid-pubescent; fruits pear-shaped.

HAB. Generally cultivated all over Burma, but more copiously in Ava and Prome.—Fl. March; Fr. CS.

### Luffa, Cav.

#### Conspectus of Species.

\* *Fruit smooth, at least not muricate or echinate.*

Fruit terete, or only with obscure darker coloured longitudinal streaks, . . . *L. cylindrica*.  
Fruit sharply 10-angular, . . . . . *L. acutangula*.

\* \* *Fruit echinate or muricate.*

Flowers monœcious, yellow, the males and females from the same leaf-axil, very shortly pedicelled; fruit muricate, . . . . . *L. graveolens*.  
Flowers dicecious, white, the males in racemes, the females solitary; fruits densely echinate, the bristles spreadingly fibrillose or rarely ciliate, . . . . . *L. echinata*.

1. *L. CYLINDRICA*, Ræm. Syn. Monog. Pep. II. 63; Naud. in Ann. d. sc. nat. 4 ser. XII. 119 cum. syn. numer. (*Momordica cylindrica*, L. sp. pl. 1433; *L. Petola*, and *L. Cattu-Picinna*, Ser. in DC. Prod. III. 303; *L. Aegyptiaca*, Mill. Dict.; DC. l. c.; Bth. Fl. Austr. III. 316; *L. pentandra*, Roxb. Fl. Ind. III. 712; WA. Prod. I. 343; Wight Icon. t. 499; *L. clavata*, Roxb. Fl. Ind. III. 714?).

Var. *a. LEOCARPA*, Naud. l. c., flowers smaller; stamens 5; fruits elongate-oblong to clavate-cylindrical, 1—1½ ft. long; seeds pale-coloured or black.

Var. *β. HEDERACEA*, (*L. hederacea*, Wall. MS.), leaves usually smaller, more scabrous; stamens 3; fruits oblong to elliptical, 2—4 in. long, rarely longer; seeds black.

HAB. Var. *β.* common in all leaf-shedding forests, in the savannahs, in hedges, rubbishy places, village-bushes, &c., all over Burma down to Tenasserim and the Andamans; var. *β.* much scarcer.—Fl. Close of RS.; Fr. CS.

The varieties of this species require further investigation.

\*2. *L. ACUTANGULA*, Roxb. Fl. Ind. II. 713; DC. Prod. III. 302; Naud. in Ann. d. sc. nat. 4 ser. XII. 122; Miq. Fl. Ind. Bat. I/1. 668. (*L. fatida*, Cav. Icon. I. 7. t. 9—10; DC. l. c.; Bot. Mag. t. 1638; *Cucumis acutangulus*, L. sp. pl. 1436; *Petola Bengalensis*, Rumph. Amb. V. t. 149; Rheed. Hort. Malab. VIII. t. 7).

HAB. Cultivated by natives in Chittagong.

*Luffa amara*, Roxb., with oblong fruits only 3—4 inches long and tapering at both ends, is probably only a variety of the above.

3. *L. GRAVEOLENS*, Roxb. Fl. Ind. III. 716; Naud. in Ann. d. sc. nat. 4 ser. XII. 124.

HAB. In rubbishy places in a village near Chittagong.—Fl. Fr. Octob.

4. *L. ECHINATA*, Roxb. Fl. Ind. III. 715; Walp. Rep. II. 200; WA. Prod. I. 343; Naud. in Ann. d. sc. nat. 4 ser. XII. 128. (*L. Bindaal*, Roxb. Fl. Ind. III. 717; Edg. in Linn. Proc. IX. 322 (*L. Bandaal*)).

HAB. Arracan, in hedges and rubbishy places in the Kolodyne valley.—Fl. Fr. Octob.

Dr. Hooker (in Fl. trop. Afr. II. 531) states that the flowers in Indian specimens of this species are always yellow, not white as Roxburgh describes and figures them. The species is common enough in the plains of Northern Bengal but never have I seen the flowers of it other than white.

### *Benincasa*, Savi.

\*1. *B. CERIFERA*, Savi Mem. sopra Piant. Cucurb. I. 1818. 6. cum icon.; DC. Prod. III. 303; Naud. in Ann. d. sc. nat. 4 ser. XII. 87; Miq. Fl. Ind. Bat. I/1. 665. Jacq. Ecl. pl. t. 153-54. (*Cucurbita Pepo*, Lour. Coch. 593; Roxb. Fl. Ind. III. 718; Rumph. Herb. Amb. V. t. 143; Rheed. Hort. Malab. VIII. t. 3).

HAB. Generally cultivated by the natives.—Fl. RS.; Fr. CS.

### *Momordica*, L.

#### *Conspectus of Species.*

\* *Monæcious*. Bracts only 2—3 lin. long, at about the middle of the filiform peduncle.

Leaves palmately 5-lobed; calyx-lobes oblong, acute; bracts entire, at the apex of the peduncle; fruit few-seeded, small, ..... *M. Charantia*.

As preceding, but bracts minutely toothed, below or near the middle of the peduncle; fruit larger, many-seeded, ..... *M. balsamina*.

\* \* *Diæcious*. Bract of the male (and sometimes of the female) flowers just below the flower and embracing the calyx,  $\frac{1}{2}$ —1 in. long or longer.

Leaves 3-5 lobed; calyx-lobes linear, acuminate; seeds about 3 lin. long, *M. dioica*. Leaves cordate, not lobed or only angular; bracts pubescent or velvety; calyx-lobes oblong, blunt; seeds about 3 lin. long, ..... *M. subangulata*.

Leaves rarely 5-lobed, with the lobes acuminate; bracts often hirsute; calyx-lobes oblong, acuminate; seeds about an inch long, ..... *M. Cochinchinensis*.

\*1. *M. CHARANTIA*, L. sp. pl. 1433; Roxb. Fl. Ind. III. 707; DC. Prod. III. 311; Bot. Mag. t. 2455; Fl. d. serr. t. 1047; WA. Prod. I. 348; Wight Icon. t. 504; Naud. in Ann. d. sc. nat. 4 ser. XII. 131; Miq. Fl. Ind. Bat. I/1. 663. (*M. muricata*, Willd. sp. pl. IV. 602; Roxb. Fl. Ind. III. 707; WA. Prod. I. 348; Miq. l. c.; *M. Senegalensis*, Lamk. Encycl. IV. 239; DC. l. c.; *Cucumis Africanus*, Ldl. Bot. Reg. XII. t. 980; *Amara Indica*, Rump. Herb. Amb. V. t. 151; Rheed. Hort. Malab. VIII. t. 9—19.).

HAB. Generally cultivated all over Burma, and frequently seen like wild in deserted toungyas and gardens, in rubbishy places around villages, &c.—Fl. Fr. C. and HS.

2. *M. BIOICA*, Roxb. Fl. Ind. III. 709; DC. Prod. III. 312; WA. Prod. I. 349; Wight Icon. t. 505—506; Dene. in Jacq. Voy. IV. 60. t. 71.; Naud. in Ann. d. sc. nat. 4 ser. XII. 133.

HAB. Burma (according to Rev. Dr. Mason).

3. *M. SUBANGULATA*, Bl. Bydr. 928; Miq. Fl. Ind. Bat. I/1. 664.

HAB. Chittagong (H. Bruce); Pegu and Prome (Wall. Cat. 6743). —Fl. Sept.

4. *M. COCHINCHINENSIS*, Spreng. Syst. Veg. III. 14. (*Muricia Cochinchinensis*, Lour. Fl. Coch. II. 732; DC. Prod. III. 318; *M. mixta*, Roxb. Fl. Ind. III. 709; WA. Prod. III. 349; Bot. Mag. t. 5145; Fl. d. serr. XIV. t. 1478; Naud. in Ann. d. sc. nat. 4 ser. XII. 132; Miq. Fl. Ind. Bat. I/1. 664; *Zucca Commersiana*, Ser. in DC. l. c. 319).

HAB. Not unfrequent in the tropical forests, especially along choungs, of the eastern and southern slopes of the Pegu Yomah, and from Martaban to Tenasserim.—Fl. Jan.—March.

### **Thladiantha, Bungo.**

1. *T. DUBIA*, Bung. Enum. Pl. Chin. Bor. 29; Walp. Rep. V. 763; Naud. in Ann. d. sc. nat. 4 ser. XII. 150; Bot. Mag. t. 5469. (*Gynopetalum Horsfieldii*, Miq. Fl. Ind. Bat. I/1. 680.)

HAB. Frequent along banks of choungs, especially along the borders of hill-toungyas and savannahs, of the Pegu Yomah.—Fl. March, April.

### **Cucumis, L.**

#### *Conspectus of Species.*

× Flowers on slender pedicels, several together in the axils of the leaves.

Ovary muricate, spindle-shaped; male flowers by 3—6, females solitary, .... *C. sativus*.  
Ovary densely villous or pubescent, usually oblong or elliptical; male and female flowers usually mixed, ..... *C. Melo*.

× × Flowers all singly from the leaf-axils, on stiff, rather short peduncles.

Flowers inconspicuous, ..... *C. trigonum*.

\*1. *C. SATIVUS*, L. sp. pl. 1437; DC. Prod. III. 300; Naud. in Ann. d. sc. nat. 4 ser. XI. 27; Roxb. Fl. Ind. III. 720.—(*C. Momordica*, Roxb. l. c.; *C. sativus* var. *Sikkimensis*, Hf. Bot. Mag. t. 6206?)

HAB. Much cultivated, especially in the plains.—Fl. Jan.

2. *C. MELO*, L. sp. pl. 1436; DC. Prod. III. 300; WA. Prod. I. 341; Roxb. Fl. Ind. III. 720; Naud. in Ann. d. sc. nat. 4 ser. XI. 34. c. syn. plurimis. (*C. deliciosus*, Roth; *C. Conomon*, Thbg.; *C. flexuosus*, L.; *C. Chate*, L. and *C. Dudaim*, L. Andr. Repos. VIII. t. 548, ap. Sering. in DC. Prod. l. c.; *C. utilissimus*, Roxb. Fl. Ind. III. 321; WA. Prod. I. 342; *C. cicutrisatus*, Stocks in Hook. Kew Gard. Misc. IV. 148; Walp. Ann. IV. 864).

Var. *α. PUBESCENS* (*C. pubescens*, Willd. sp. pl. IV. 614; Wight Icon. t. 496; WA. Prod. I. 342; Roxb. Fl. Ind. III. 723; DC. Prod. III. 301; Royle Ill. Him. Pl. I. 220. t. 47. f. 1; *C. Melo agrestis*, Naud. in Ann. d. sc. nat. 4 ser. XI. 73; *C. trigonus*, Bth. Fl. Austr. III. 317, vix. Roxb.; *C. Maderaspatanus*, Roxb. Fl. Ind. III. 723, non L.; *C. turbinateus*, Roxb. l. c. ?, lobis calycinis subulatis et tubo supra ovario valde constricto insignis), all parts much smaller; fruits only as large as a plum, from oblong to turbinate, not edible; flowers smaller and shorter pedicelled, usually only by 2—3 in the leaf-axils.—Considered by Naudin to be the wild stock of the cultivated melons.

Var. *β. CULTA* (cf. syn. sub specie citat. et var. numerosissimæ ap. Naud. l. c.), all parts more robust; fruits larger and often very large, variously shaped; flowers nearly an inch across, on long filiform pedicels, usually by 3—5 from the leaf-axils.

HAB. Var. *α.* not unfrequent along banks of rivers, in uncultivated and rubbishy places, etc., all over Ava, Chittagong and Pegu; var. *β.* generally cultivated in several varieties.—Fl. H. & R. S; Fr. DS.

#### **Citrullus**, Schrad.

\*1. *C. VULGARIS*, Schrad. in Linnæa XII. 412; Naud. in Ann. d. sc. nat. 4. ser. XII. 100 cum syn. numerosis. (*Cucurbita Citrullus*, L. sp. pl. 1435; Roxb. Fl. Ind. III. 719; WA. Prod. I. 351; *Cucumis Citrullus*, Ser. in DC. Prod. III. 301; *C. fistulosus*, Stocks in Hook. Journ. Kew. Gard. Misc. III. 74. t. 3; Walp. Ann. IV. 863; *Anguria Indica*, Rumph. Herb. Amb. V. t. 146).

HAB. Much cultivated all over the country.—Fl. Jan., Febr.; Fr. HS.

#### **Cephalandra**, Schrad.

1. *C. GRANDIS* (*Bryonia grandis*, L. Mant. 126; DC. Prod. III. 805; *Momordica monadelphæ*, Roxb. Fl. Ind. III. 708; *Coccinia Indica*, WA. Prod. I. 347; Wight Ill. II. t. 105; Dene. in Jacq. Voy. IV. 60. t. 72; Hook. Icon. t. 138).

**HAB.** Frequent in hedges, village-bushes, along river-banks and in rubbishy places, all over Ava, Chittagong, Arracan, and Pegu.—Fl. Sept., Aug.

### **Cucurbita, L.**

#### *Conspectus of Species.*

× Calyx-lobes subulate.

Leaves not deeply lobed; petiole scarcely prickly, ..... *C. maxima*.

Leaves deeply lobed; petiole prickly, ..... *C. Pepo*.

× × Calyx-lobes leafy.

Leaves more or less lobed; petiole scarcely prickly, ..... *C. moschata*.

\*1. *C. MOSCHATA*, Duch. Dict. d. sc. nat. XI. 234; DC. Prod. III. 317; Naud. in Ann. d. sc. nat. 4 ser. VI. 47. (*C. maxima*, WA. Prod. I. 351; Wight Icon. t. 507, non Duch.; Rheed. Hort. Malab. VIII. t. 2).

**HAB.** Cultivated in Chittagong, Pegu, and probably elsewhere.—Fl. Fr. April, May.

### **Bryonia, L.**

1. *B. LACINIOSA*, L. Mant. 498; Roxb. Fl. Ind. III. 728; DC. Prod. III. 308; WA. Prod. I. 345; Wight Icon. t. 500; Planch. Fl. d. serr. 2 ser. II. 39. t. 1202; Naud. in Ann. d. sc. nat. 4 ser. XII. 139.

**HAB.** Not uncommon in hedges and in rubbishy places near villages of Prome and Chittagong.—Fl. Octob.; Fr. March.

### **Muckia, Arn.**

1. *M. MADERASPATANA*, Kurz in Journ. As. Soc. Beng. 1871, 58. (*Cucumis maderaspatanus*, L. sp. pl. 1438, non Roxb.; *M. scabrella*, Arn. in Hook. Journ. Bot. III. 276; Wight Ill. II. t. 105\*; Walp. Rep. II. 199; Naud. in Ann. d. sc. nat. 4 ser. XII. 142; *Bryonia scabrella*, L. f. Suppl. 424; Roxb. Fl. Ind. III. 724; Wight Icon. t. 501).

Var. *α. SCABRELLA*, leaves broadly triangular to ovate in outline, deeply sinuate-cordate at the base, 3—5-lobed or -angular, the lobes acute or blunt; berries often 4—6 lin. thick.

Var. *β. GRACILIS*, (*Bryonia gracilis*, Wall. Cat. 6714), leaves not lobed nor angular, ovate-lanceolate, acuminate, almost hastate-cordate at the base; berries usually only 3—4 lin. thick.

**HAB.** Both varieties frequent in hedges, bushes, &c., in deserted town-gyas, along river-banks, &c., all over Burma; var. *β.* more especially in the savannahs of the plains.—Fl. Fr. CS.

### **Zehneria, Endl.**

#### *Conspectus of Species.*

Subg. 1. *Karivia*, Arn Berry large, nearly 2 in. long; seeds numerous, almost globular.

Leaves polymorphic, almost chartaceous, glabrous, ..... *Z. umbellata*.

*Subg. 2. Zehneria*, Endl. Berry small, globose. Seeds few, compressed-oblong. Leaves herbaceous, flaccid, cordate, repand-toothed, ..... *Z. Hookeriana*.

1. *Z. UMBELLATA*, Thw. in Ceyl. Pl. 125. (*Bryonia umbellata*, Klein in Willd. sp. pl. III. 618; WA. Prod. I. 345; *Momordica umbellata*, Roxb. Fl. Ind. III. 710; *Karivia umbellata*, Arn. in Hook. Journ. Bot. III. 275; Miq. Fl. Ind. Bat. I/1. 661).

HAB. Common, not only in cultivated lands, in bushes, hedges, &c., in and around villages, but still more so in the mixed forests and savannahs, all over Burma, up to 3000 ft. elevation.—Fl. H. and RS.; Fr. CS.

2. *Z. HOOKERIANA*, WA. in Hook. Journ. Bot. III. (*Bryonia Hookeriana*, WA. Prod. I. 345; Wight Ill. t. 105).

HAB. Ava, Khakyen hills.—Fr. May.

### Melothria, L.

1. *M. INDICA*, Lour. Fl. Coch. I. 43; DC. Prod. III. 313; Naud. in Ann. d. sc. nat. 4 ser. XVI. 169. t. 2. (*Bryonia tenella*, Roxb. Fl. Ind. III. 725; *Aechmandra Indica*, Arn. in Hook. Journ. of Bot. III. 274; *Cucumis murinus viridis*, Rumph. Herb. Amb. V. t. 171. f. 2?).

HAB. In hedges near Chittagong.—Fl. Fr. Octob.

### Rhynchoscarpa, Schrad.

#### Conspectus of Species.

All parts more or less pubescent; leaves cordate with rounded basal lobes; berry striate, hairy, ..... *R. rostrata*.

Leaves deltoid with spreading acute basal lobes, rough above; berries smooth and glabrous, ..... *R. deltoidea*.

1. *R. ROSTRATA*, (*Bryonia rostrata*, Rottl. Nov. Act. Berol. IV. 212; DC. Prod. III. 304; WA. Prod. I. 346; *Bryonia pilosa*, Roxb. Fl. Ind. III. 726).

HAB. Ava, Irawaddi valley near Pagha myo (Wall. Cat. 6713).—Fl. Sept.

2. *R. ? DELTOIDEA*, Kurz MS.

HAB. Upper Tenasserim, in Attaran (Dr. Brandis); Pegu and Prome Irawaddi valley.—Fl. Fr. Sept., Octob.

### Gomphogyne, Griff.

#### Conspectus of Species.

Capsule club-shaped, rather narrow; seeds usually 4, about a line long, rounded, obscurely tubercled-wrinkled, ..... *G. heterosperma*.

Capsule broadly turbinate: seeds usually 2, about 3 lin. long, oblong-4-angular, rough with tubercled margins, ..... *G. cissoides*.

1. *G. HETEROSPERMA*, Kurz in Journ. As. Soc. Beng. 1871. 58. (*Zanonia heterosperma*, Wall. Cat.; Miq. Fl. Ind. Bat. I/1. 683; *Alsomitra heterosperma*, Ræm. Syn. Monog. II. 118).

HAB. Ava, on Taong dong (Wall.).—Fr. Nov.

A simple-leaved species of *Actinostemma*, or more probably *Gomphostemma*, is not unfrequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah, especially at the head-waters of the Swa-choung, but I did not succeed in finding either flower or fruit of it.

### **Alsomitra, Rcm.**

1. A. SARCOPHYLLA, Bth. and Hf. Gen. Plant. 1. 840; Bot. Mag. t. 6017. (*Zunonia sarcophylla*, Wall. Pl. As. rar. II. 28. t. 133).

HAB. Not unfrequent in waste places, light jungle, on limestone rocks, &c., of Ava from Mandalay as far south as Prunc.—Fl. Sept.; Fr. Octob.

## **BEGONIACEÆ.**

### **Begonia, L.**

#### *Conspectus of Species.*

*Subg. 1. Casperea, DC.* Capsule fleshy and berry-like, dehiscing on the angles or broad thick wings.

A robust rather glabrous branched herb; styles 4; berry 4-celled and 4-cornered, the angles produced into as many horn-like appendages, ..... *B. Roxburghii*.

*Subg. 2. Begonia, DC.* Capsules dry, dehiscing in a semi-circular line along their sides near the wings or angles.

\* Styles 2, each branch 2-cleft or variously dilated or branched; capsule 2-celled. Placentas 2-parted, i. e. consisting of 2 longitudinal ovule- or seed-bearing blades.

× Stamens free. Capsule unequally 3-winged, the 2 lateral wings often reduced to a membranous rib.

A robust branched herb, softly pulraceous-pilose; leaves long-petioled, lobed,

.. *B. laciniata*.

As preceding but more slender and quite glabrous, ..... *B. megaptera*.

Robust rather simple herb, softly pulraceous-pilose; leaves long-petioled, not lobed; petals pale rose-coloured, only about  $\frac{1}{2}$  in. long; capsules stuppose-hirsute, the lower wing broad and rounded,  $\frac{3}{4}$  in. long, ..... *B. nemophila*.

As preceding but more glabrous; flowers larger; capsules glaucous-green, glabrous,

.. *B. barbata*.

× × Stamens monadelphous.

+ Male perianth 5-lobed, the female one 5—6-lobed. Capsule unequally 3-winged.

† Inflorescence axillary or arising from the base of the leaf, or prolific from an axillary bud.

‡ Not prolific. Leaves alternate or whorled, rarely reduced to a single one. Flowers small, white.

O Glabrous.

Leaves alternate, the petioles 1—2 lin. long, ..... *B. procrisifolia*.

Leaves whorled, longer petioled, ..... *B. verticillata*.

O O Stems and petioles pubescent.

- Inflorescence glabrous; leaves alternate, long-petioled, sparingly and minutely hirsute above, ..... *B. Martabanica*.  
 † † Prolific, with a solitary radical or a few alternate leaves. Flowers small, white.
- More or less stellate-velvety; inflorescence glabrous; leaves alternate or rarely solitary, ..... *B. sinuata*.
- Glabrous; leaf solitary, from the base of which 2 or more flowering peduncles arise, ..... *B. prolifera*.
- Stems etc. and the conspicuously bracted inflorescence palaceous-pilose, the indumentum often intermixed with soft gland-hairs, ..... *B. paleacea*.  
 † † Leaves and inflorescence radical.
- Leaves contracted into a petiole 2—3 lin. long, ciliate, hispid above; flowers nearly an in. in diameter, white, ..... *B. nivea*.  
 + + Perianth of both sexes 2-sepalled, apetalous.
- Very tender herb; leaves alternate, minutely and sparingly pilose above; flowers small, ..... *B. flaccidissima*.  
 \* \* Styles 3, free or connate. Capsule 3-celled and 3-winged.  
 × Placentas entire and simple.
- Glabrous, the inflorescence radical or nearly so; leaves radical, deeply lobed; perianth 2-sepalled, apetalous, ..... *B. Brandisiana*.  
 × × Placentas 2-cloft.  
 + Caulscent herbs, with alternate cauline leaves.
- All parts (also the inflorescence) glabrous; capsule 3 lin. long, the wings truncate at the apex; stamens monadelphous, ..... *B. parvuliflora*.
- Leaves sparingly and minutely bristly and glossy above, in other respects very similar to the preceding; capsule  $\frac{1}{2}$  in. long; stamens free, the anthers mucronulate; styles free, ..... *B. modestiflora*.
- Like preceding, but leaves opaque and more pilose; stamens monadelphous, the anthers terminated by the broad truncate connective; styles united up to the middle, ..... *B. scutata*.
- Leaves minutely and sparingly pilose; inflorescence glandular-puberulous; stamens monadelphous; capsule-wings half-sagittate, produced into blunt basal lobes, ..... *B. surculigera*.  
 + + Scapigerous herbs, the leaves and inflorescences radical and usually solitary.
- Leaves very long-petioled, peltate at the base, papilloso-dotted and glabrous, ..... *B. subperfoliata*.
- Leaves very long-petioled, cordate (not peltate), papillose and minutely pilose above; stamens free, ..... *B. velutina*.
1. *B. ROXBURGHII*, DC. Prod. XV/1. 398 (*Cusparia oligocarpa*, DC. l. c. 276; *B. Malabarica*, Roxb. Fl. Ind. III. 648; *Casparea polycarpa*, DC. Prod. l. c. 277).  
 HAB. Chittagong.
2. *B. LACINIATA*, Roxb. Fl. Ind. III. 649; Bot. Mag. t. 5021; DC. Prod. XV/1. 347.  
 HAB. Along rivulets of the damp hill-forests of the Martaban hills east of Tounghoo, at 6—7000 ft. elevation. Fr. March.

3. *B. MEGAPTERA*, A. DC. in Ann. d. sc. nat. 4 ser. XI. 134 ; and Prod. XV/1. 348.

HAB. Martaban hills (Nattoung) east of Tounghoo (Revd. Mason).

4. *B. NEMOPHILA*, Kurz MS.

HAB. Not unfrequent in the damp hill-forests, especially along rocky streamlets, of the Martaban hills east of Tounghoo, at 3000 to 4000 ft. elevation.—Fl. Fr. March.

5. *B. PROCRIDIFOLIA*, Wall. Cat. 6292 ; DC. Prod. XV/1. 352.

HAB. Tenasserim, Tavoy (Wall.).—Fl. Fr. Aug.

6. *B. VERTICILLATA*, Hook. Icon. Pl. t. 811 ; DC. Prod. XV/1. 353.

HAB. Tenasserim, Moulmein hills (Lobb, Parish).

7. *B. MARTABANICA*, A. DC. in Ann. d. sc. nat. 4 ser. XI. 136 and Prod. XV/1. 354.

HAB. Tenasserim (Lobb, Helfer).

8. *B. SINUATA*, Wall. Cat. 3680 ; Meisn. in Linn. 1838. Litt. 15. de prolif. ; DC. Prod. XV/1. 354. (*Diploclinium biloculare*, Wight Icon. t. 1840 ; *B. Andamanensis*, Parish MS. in Kurz And. Rep. p. 15).

HAB. Tenasserim frequent from Moulmein down to Mergui ; also on the Andamans.—Fl. Fr. June, July.

9. *B. PROLIFERA*, A. DC. in Ann. d. sc. nat. 4 ser. XI. 135 and Prod. XV/1. 353.

HAB. Tenasserim, Moulmein (Parish, Lobb).

10. *B. PALEACEA*, Kurz in Journ. As. Soc. Beng. 1871. 60.

HAB. Upper Tenasserim, by the sides of hill-streams.—Fl. Fr. June—Aug.

11. *B. NIVEA*, Parish in Journ. As. Soc. Beng. 1873. 81.

HAB. Tenasserim, Moulmein (Parish).

12. *B. FLACCIDISSIMA*, Kurz in Journ. As. Soc. Beng. 1872. 308.

HAB. Martaban, on Zwakabin, a lime-stone hill north of Moulmein. (Parish).—Fl. Octob.

13. *B. BRANDISIANA*, Kurz in Journ. As. Soc. Beng. 1871. 58.

HAB. Tenasserim, Attaran (Dr. Brandis).

14. *B. PARVULIFLORA*, A. DC. Ann. d. sc. nat. 4 ser. XI. 136 and Prod. XV/1. 355.

HAB. Upper Tenasserim (Lobb).

15. *B. MODESTIFLORA*, Kurz in Journ. As. Soc. Beng. 1871. 59.

HAB. On sandstone-rocks in the bed of hill-streams on Baronga island opposite Akyab, Arracan, up to 1000 ft. elevation.—Fl. Sept., Oct.

16. *B. SCUTATA*, Wall. Cat. 3686 ; DC. Prod. XV/1. 328. (*B. dioica*, Don. Prod. Nep. 223 ?).

HAB. Ava, near Bhamo, and most probably elsewhere.—Fl. Fr. Sept.

17. *B. SUBCULIGERA*, Kurz in Journ. As. Soc. Beng. 1871. 59.

HAB. Arracan, frequent on moist mossy sandstone-rocks in the tropical forests of the Akyab district.—Fl. Fr. Octob.

18. *B. SUBPERFOLIATA*, Parish in Journ. As. Soc. Beng. 1873. 81.

HAB. Tenasserim, Moulmein District. (Revd. Parish).

19. *B. VELUTINA*, Parish in Journ. As. Soc. Beng. 1873. 81.

HAB. Tenasserim, Moulmein District (Parish, Stoliczka).

Habit of *B. subpeltata*, Wight, but differs in the 2-lamellate placentas.

### DATISCACEÆ.

#### Tetrameles, R. Br.

1. *T. NUDIFLORA*, R. Br. in Horsf. Pl. Jav. rar. 79. t. 17; DC. Prod. XV/1. 411; Bedd. Fl. Sylv. t. 212. (*T. Grahamiana*, Wight Icon. t. 1956).

Var. *α. GENUINA*, leaves more or less pubescent beneath.

Var. *β. GLABRA*, leaves glabrous.

HAB. Frequent in the tropical forests and along choungs in the upper mixed forests, all over Pegu and Martaban down to Tenasserim and the Andamans; var. *β.* on the Andamans.—Fl. HS. Fr. Begin of RS.

The open ovary, the parietal placentation, and the habit generally (especially of *Dutisca*) point to *Resedaceæ*.

### CACTEÆ.

#### Opuntia, Mill.

\*1. *O. DILLENII*, Haw. in DC. Prod. III. 472; WA. Prod. I. 363; Wight Ill. II. t. 114. (*Cactus Dillenii*, Bot. Reg. t. 255; *Cactus Indicus*, Roxb. Fl. Ind. II. 475).

HAB. Cultivated in the drier districts of Burma, as in Prome.

### FICOIDEÆ.

#### Conspectus of Species.

*Trib. I. AIZOIDEÆ.* Calyx free but with a distinct turbinate tube bearing the stamens at or below the summit. Fruit a capsulo. (*Capsule circumsciss.* *Leaves opposite.*)

*SESUVIUM.* Stamens 5 to many. Ovary 3—5-celled, with axillary many-ovuled placentas.

*TRIANTHEMA.* Stamens 5 or 10, or many. Ovary 1—2-celled, with basilar 1-mono-ovuled placentas.

*Trib. II. MOLLUGINEÆ.* Calyx free, divided to the base or nearly so. Petals 3—5, or none. Stamens hypogynous or almost perigynous. Fruit a capsule or divided into 2—3 cocci.

\* *Fruit a capsule.\* Leaves usually with stipules.*

*MOLLUGO.* Petals 3—5, or none. Ovary 3—5-celled, with many ovules in each cell. Leaves usually spuriously whorled.

*Fruit 2—3-coccous, the cocci 1-seeded. Leaves without stipules.*

*CIBAKIA*. Petals none. Carpels 3—5, free. Utricles 5—3. Leaves opposite or spuriously whorled.

### **Sesuvium, L.**

1. *S. PORTULACASTRUM*, L. sp. pl. 446; DC. Prod. III. 453; Roxb. Fl. Ind. II. 509.

HAB. Not unfrequent on mud banks of tidal channels and in the tidal jungles of lower Pegu and Tenasserim; also on the Andamans.—Fl. May—June.

### **Trianthema, L.**

#### *Conspectus of Species.*

\* *Ovary and capsule 2-celled; styles 2.*

Flowers clustered; stamens 10 or 11; ovary 4-ovuled, ..... *T. decandra*.

Flowers clustered; stamens 5; ovary 4-ovuled, ..... *T. pentandra*.

\* \* *Ovary and capsule 1-celled; style 1.*

Leaves obovate, rather large, glabrous or slightly pubescent; flowers solitary; ovary many-ovuled; stamens about 15; style long, ..... *T. obcordata*.

Leaves linear, small, covered with crystalline dots; stamens 5; style short, simple,

... *T. crystallina*.

1. *T. DECANDRA*, L. Mant. 70; Roxb. Fl. Ind. II. 444; WA. Prod. I. 355; Wight Icon. t. 296.

HAB. Ava, on the banks of the Irrawaddi.—Fl. Fr. Jan.

2. *T. OBCORDATA*, Roxb. Fl. Ind. II. 445; WA. Prod. I. 355; Wight Icon. t. 288.

HAB. Arracan, in rubbishy places near Akyab.

Requires comparison with *Trianthema monogyna*, L.

3. *T. CRYSTALLINA*, Vhl. Symb. I. 32; Roxb. Fl. Ind. II. 444; WA. Prod. I. 355; Edg. in Linn. Journ. VI. 203.

HAB. Ava, on sand-banks of the Irrawaddi, as near Yenaygehoun (Wall.).—Fl. Sept.

### **Mollugo, L.**

#### *Conspectus of Species.*

*Subg. 1. Glinus, L.* Seed with a strophiole dilated into a small arillus.

Softly pubescent or tomentose; flowers rather large, in axillary clusters; stamens about 10—15, ..... *M. Glinus*.

Glabrous or slightly pubescent; flowers rather small, on long slender pedicels, forming axillary clusters; stamens fewer than 10, ..... *M. Spergula*.

*Subg. 2. Mollugo, L.* Seeds without a strophiole.

Glabrous, the stems angular; flowers minute, on capillary pedicels, forming cymes,

... *M. stricta*.

1. *M. GLINUS*, A. Rich. Fl. Abyss. I. 48. (*Glinus lotoides*, L. sp. pl. 663; DC. Prod. III. 455; WA. Prod. I. 362; Fenzl Monogr. Mollug. 357;

Sibth. Fl. Graec. t. 472; *Tryphera prostrata*, Bl. Bydr. 549; DC. Prod. XIII/2. 424).

Var.  $\alpha$ . LOTOIDES, (*Glinus lotoides*, L. l. c.; *M. Glinus a. candida*, Fenzl. Monogr. Monog. Mollug. 358), branches often white-tomentose; flowers sessile or nearly so.

Var.  $\beta$ . DICTAMNOIDES, (*Glinus dictamnoides*, L. Mant. 248; DC. Prod. III. 455; WA. Prod. I. 362; *Pharnaceum pentagynum*, Roxb. Fl. Ind. II. 103), leaves pubescent but greenish; flowers usually pedicelled.

HAB. Var.  $\alpha$ . common in fallow-fields, along river-banks, in rubbishy places, etc. all over Pegu, especially in the cultivated plains; also Ava.—Fl. May, June.

2. M. SPERGULA, L. sp. pl. 131; DC. Prod. I. 391; WA. Prod. I. 44. (*M. stricta*, Roxb. Fl. Ind. I. 360; *M. parviflora*, Ser. ap. DC. Prod. I. 391; *Glinus Mollugo*, Fenzl. Monog. Mollug. 359; *Alsine erecta* Burm. Zeyl. 13. t. 7; *Pharnaceum Mollugo*, L., Roxb. Fl. Ind. II. 102).

HAB. Frequent in fallow-fields, along road-sides and river-banks, in rubbishy places, etc. all over Burma, especially the cultivated plains, ascending up to 4500 ft. elevation into the hill-toungyas of Martaban.—Fl. HS.

3. M. STRICTA, L. sp. pl. 131; DC. Prod. I. 391; Fenzl. Monogr. Mollug. 380; Walp. Rep. II. 241; WA. Prod. I. 44.

Var.  $\alpha$ . STRICTA (*M. stricta*, L. l. c.), leaves rather thin and green, linear-lanceolate, usually acuminate at both ends.

Var.  $\beta$ . PENTAPHYLLA, Bth. Fl. Hongk. 23. (*M. pentaphylla*, L. sp. pl. 131; DC. Prod. I. 391; Roxb. Fl. Ind. I. 359; WA. Prod. I. 44; Fenzl. Monogr. Mollug. 381; *M. triphylla*, Lour. Fl. Cochinch. 79; DC. Prod. I. 392; Roxb. Fl. Ind. I. 360; WA. Prod. I. 44).

HAB. Var.  $\beta$ . not uncommon in toungyas and native gardens of Martaban and Pegu, and most probably elsewhere.—Fr. May.

#### Gisekia, L.

1. G. PHARNACEOIDES, L. Mant. 2. app. 562; Roxb. Corom. Pl. II. t. 183; DC. Prod. XIII/2. 27; Wight Icon. t. 1167.

HAB. Ava, near Yenang choung, road to the Petroleum-wells. (Wall.).

### UMBELLIFERÆ.

#### Conspectus of Species.

\*. Umbels simple or irregularly (very rarely regularly) compound.

No vittæ in the furrows of the mericarp.

Trib. 1. HYDROCOTYLEÆ. Fruits laterally compressed, the mericarps rounded or acute on the back (not sharply angular).

HYDROCOTYLE. Fruits much compressed. Calyx-teeth minute or obsolete. Petals concavo, valvate or imbricate. Umbels simple. Creeping herbs with simple leaves.

Trib. 2. SANICULEÆ. Mericarps almost terete or laterally compressed, the commissure broad. Calyx-teeth or lobes usually conspicuous.

**SANICULA.** Mericarps echinate from bristles which are often hooked. Flowers podicelled, polygamous. Bracts small. Umbels very small, usually paniced. Leaves dissected, toothed.

*Umbels regularly compound.*

× Primary ribs of the mericarp more or less conspicuous, secondary ones none. Vittæ in the furrows usually conspicuous or obscure, very rarely none.

**Trib. 3. AMMINEÆ.** Fruits laterally compressed, or narrowed or sulcate on both sides of the commissure.

\* *Seeds with a convex or almost flat face.*

× Leaves simple. Flowers yellow.

**BUPLEURUM.** Umbels compound or rarely the flowers in heads. Calyx-teeth obsolete. Disk-lobes almost flat. Leaves entire, flat.

× × Leaves variously compound. Flowers usually white, rarely yellow.

**APIUM.** Carpophore simple or 2-cleft at the apex. Fruit didymous or ovate, the mericarps almost straight. Petals entire, blunt or acute.

**CARUM.** Carpophore 2-cleft or 2-parted. Fruit ovate or oblong, the ribs rather prominent. Involucre-bracts few and small, or none. Petals notched or 2-lobed. Calyx-teeth obsolete or slightly prominent. Disk-lobes conical, or the disk convex.

**PIMPINELLA.** Carpophore 2-cleft or 2-parted. Ribs of the mericarps narrow, the vittæ numerous, conspicuous or very thin. Involucre-bracts few and small, or none, very rarely numerous. Petals white or yellow. Disk-lobes thick, cushion-like or conical. Calyx-teeth obsolete or very rarely small.

**Trib. 4. SESELINEÆ.** Fruits transversely terete or compressed from the back, the commissure broad, the lateral ribs either distinct, or united to the nerve-like or corky-thickened margin which is not dilated.

\* *Fruit transversely sub-terete or more or less compressed from the back, the primary ribs not winged.*

× Primary ribs of the mericarps almost equal, not winged.

**FÆNICULUM.** Fruits not beaked, the primary ribs thin or thick but not corky, the secondary ones wanting. Calyx-teeth obsolete. Petals entire, yellow.

× × Lateral ribs of the mericarps not winged, confluent with the thick, often corky margin, entire after the dehiscence. Vittæ solitary in the furrows.

**OENANTHE.** Petals notched or 2-lobed. Carpophore absent. All ribs of the mericarps very blunt and almost corky. Leaves usually pinnate or dissected. Umbels compound.

\* \* *Fruits compressed from the back or almost terete, all the primary ribs, or only the keeled ones, more or less expanded into thick wings, the wings equal, or the lateral ones broader.*

**SELINUM.** Fruits ovate, somewhat compressed from the back, the ribs equally winged or the lateral ones broader. Disk-lobes conical or depressed. Flowers white or yellowish green.

**Trib. 5. PEUCEDANEÆ.** Fruit much compressed from the back, the lateral ribs dilated into wing-like or broadly swollen margins, remaining entire after the dehiscence.

**PEUCEDANUM.** Mericarps more or less convex on the middle, (rarely nearly flat) the margins rather thick and sharp, or broadly winged, vittæ solitary in the furrows

and conspicuous, or rarely by 2—3 and obsolete, reaching the base of the fruit or sometimes shorter.

**HERACLEUM.** Petals often radiate. Mericarps flat-compressed or hardly convex at the middle, the margins wing-like; vittæ solitary or rarely by twos in the furrows, often clavate, reaching the base of the fruit or more usually shorter.

× × Secondary ribs of the mericarps filiform, somewhat prominent or winged, rarely all the ribs more or less inconspicuous; vittæ in the furrows or below the secondary ribs conspicuous or obsolete.

**Trib. 6. CAUCALINEÆ.** Fruit almost terete or slightly compressed from the sides, or more so from the back, not winged, or rarely the primary ribs expanded into deeply lobed wings or divided into spines.

\* *Mericarps glabrous, the ribs blunt, smooth or wrinkled.*

**CORIANDRUM.** Fruits almost globose, the broad very blunt secondary ribs hardly prominent. Involucre none.

\* *Mericarps hirsute, bristly or aculeate.*

**DAUCUS.** Seed with rather flat face. Involucre-bracts usually dissected.

**CAUCALIS.** Seed deeply sulcate or involute on the face. Involucre-bracts linear or none.

### Hydrocotyle, L.

#### Conspectus of Species.

\* *Leaves entire or crenate. Umbels bracted.*

Flowers by 3—4 in the head, sessile; fruits nearly 2 lin. in diameter, each mericarp with 2 hardly prominent ribs, ..... *H. Asiatica.*

\* \* *Leaves more or less lobed, the lobes acute or blunt, crenate or serrate. Umbels without bracts.*

× Peduncles and petioles more or less puberulous.

Flowers numerous, almost sessile or very shortly pedicelled, forming rather crowded terminal head-like umbels, the lower ones solitary and axillary, .... *H. Javanica.*

× × All parts quite glabrous.

Flowers on slender pedicels, forming slender solitary umbels in the axils of the leaves, .. *H. Birmanica.*

1. *H. ASIATICA*, L. sp. pl. 234; DC. Prod. IV. 62; Roxb. Fl. Ind. II. 682; Wight Icon. t. 565. (*H. cordifolia*, Hf. in Hook. Icon. pl. t. 303).

**HAB.** Rather frequent in grass-land, especially along river-sides, in cultivated lands chiefly, all over Pegu and Martaban, up to 2500 ft. elevation, and no doubt all over the country; Andamans introduced, and now much spread.—Fr. Febr.

2. *H. JAVANICA*, Thunb. Diss. II. 415. t. 3; Miq. Fl. Ind. Bat. I. 734. (*H. Nepalensis*, Hook. Exot. Bot. I. t. 30; *H. polyccephala*, WA. Prod. I. 366, Wight Icon. t. 1003).

**HAB.** In the betelnut-plantations of the Martaban hills east of Tounghoo, up to 3000—4000 ft. elevation.

3. *H. BIRMANICA*, Kurz in Journ. As. Soc. Beng. 1871. 60.

**HAB.** Upper Tonasserim, Daunat toun, 3000 ft. (Dr. Brandis); Thonggyeen, at 5000 ft. elevation (Revd. Parish).

**Sanicula, L.**

1. *S. EUROPEA*, L. sp. pl. 339; DC. Prod. IV. 84; Fl. Dan. II. t. 283; Engl. Bot. II. t. 98. Rehb. Flor. Germ. XXI. t. 1847. (*S. montana*, Reinw. in Bl. Bydr. 832; DC. Prod. IV. 85; Miq. Fl. Ind. Bat. I/1. 736; *S. Javanica*, Bl. Bydr. 852; DC. Prod. IV. 85; *S. elata*, Ham. in Don. Prod. Nep. 183, Wight Icon. t. 1004 and 334 and Spicil. Nilgh. t. 79 and Illustr. t. 117; DC. Prod. IV. 85).

HAB. Ava, Khakyen hills (J. Anderson).—Fl. April.

**Bupleurum, L.**

1. *B. TENUE*, Don. Prod. Nep. 182; DC. Prod. IV. 128.

HAB. Along grassy outskirts of the drier hill-forests of the Martaban hills east of Tounghoo, as on Nattoung at about 7000 ft. elevation.—Fr. Febr.

**Apium, L.**

\*1. *A. GRAVEOLENS*, L. sp. pl. 379; DC. Prod. IV. 101; Engl. Bot. t. 1210.

HAB. Only cultivated in gardens of the drier districts chiefly, as Prome and Ava.—Fl. HS.

**Carum, L.***Conspectus of Species.*

\* *Fruits glabrous.*

Flowers yellowish or greenish yellow, ..... *C. Petroselinum*.

Flowers white; calyx-teeth obsolete; fruits oblong, ..... *C. Carvi*.

\* \* *Fruits hirsute or puberulous.* Flowers white.

Leaves ternati-sect, lobes of the segments oblong-linear, ..... *C. Roxburghianum*.

Leaves pinnately decompound, the lobes of the segments setaceous, ..... *C. Copticum*.

\*1. *C. PETROSELINUM*, Bth. and Hf. Gen. Plant. I. 891. (*Petroselinum sativum*, Hoffm. Umb. I. 78; DC. Prod. IV. 102; Hayne Arznei Gew. 7. t. 23).

HAB. Only cultivated in gardens of Europeans, chiefly in the drier districts.

2. *C. ROXBURGHIANUM*, Bth. and Hf. Gen. Plant. I. 891. (*Apium involucratum*, Roxb. Fl. Ind. II. 97; *Pimpinella involucrata*, WA.; Wight Icon. t. 567).

Var. *α. GENUINA*, all parts minutely puberulous; fruits greyish hirsute.

Var. *β. GLABRIUSCULA*, all parts less puberulous or almost glabrous; fruits slightly puberulous.

HAB. Much cultivated all over the country up to 2000 ft. elevation, and not unfrequently springing up in recently deserted toungyas; var. *β.* near Prome (Wall.); central parts of the Pegu Yomah, Zamayee. (Dr. Brandis).—Fl. Fr. CS.

N. B. *Carum Carvi*, L., and *O. Copticum*, Bth. and Hf. (*Ptychotis Ajowan*, DC.), are numerated by Rev. Mason in his list of Burmese plants as introduced.

### Pimpinella, L.

Slender almost glabrous annual; peduncles filiform; umbels without bracts,  
 .. *P. Heyneana*.  
 Robust pubescent herb; peduncles stout; involucre bracts linear,  $\frac{1}{2}$ — $\frac{3}{4}$  as long as the  
 peduncles, .. *P. Parishiana*.

1. P. HEYNEANA, Bth. and Hf. Gen. Plant. I. 894. (*Helosciadium?* *Heyneanum*, DC. Prod. IV. 106; *Anethum trifoliatum*, Roxb. Fl. Ind. II. 96).

HAB. Locally but socially in the upper mixed forests of the Pegu Yomah.—Fr. Nov., Dec.

2. P. PARISHIANA, Kurz in Journ. As. Soc. Beng. 1872. 309.

HAB. Martaban, on the Zwakabin (Rev. Parish, No. 315).

Habit of *P. diversifolia*.

### Fœniculum, Ad.

\*1. F. VULGARE, Gærtn. Fruct. I. 105; DC. Prod. IV. 142; Wight Icon. t. 515. (*Anethum Fœniculum*, L. sp. pl. 722; Engl. Bot. t. 1208).

HAB. Cultivated in native gardens and fields, especially in the Prome District.

### Oenanthe, L.

#### Conspectus of Species.

Leaves pinnately decomposed; umbels on short leaf-opposed peduncles or almost sessile, ..... *O. Benghalense*.  
 Leaves pinnate (rarely bipinnate); umbels on very long peduncles, .... *O. stolonifera*.

1. O. STOLONIFERA, DC. Prod. IV. 138; Wight Icon. t. 571. (*Phellandrium stoloniferum*, Roxb. Fl. Ind. II. 93).

HAB. In swamps and in and around stagnant waters of the alluvial plains of Pegu, here and there, as in the ditches round the fort of Tounghoo; about Rangoon, &c.—Fl. May.

### Selinum, L.

1. S. SP.?

A species apparently of this genus is not unfrequent on the hill-pastures of the Martaban hills east of Tounghoo, above 6000 ft. elevation, but the plants (like those of 2 or 3 other umbelliferous plants which grew in company with it) were too much dried up to permit of identification.

### Peucedanum, L.

#### Conspectus of Species.

Glabrous, glaucous; leaves pinnately decomposed, the lobes filiform, ..... *P. Sowa*.  
 Leaves pinnate, the leaflets puberulous beneath, broadly oblong, serrate, often lobed,  
 .. *P. Pastinaca*.

\*1. P. SOWA, Bth. and Hf. Gen. Plant. (*Anethum Sowa*, Roxb. Fl. Ind. II. 96; Wight Icon. t. 572).

HAB. Much cultivated in the plains as well as in the hills up to 2000 ft. elevation, and often springing up in recently deserted toungyas.—Fl. Fr. CS.

\*2. P. PASTINACA, Bth. and Hf. Gen. Plant. (*Pastinaca sativa*, L. sp. pl. 376; DC. Prod. IV. 188).

HAB. Only cultivated, especially in gardens of Europeans.

### *Heracleum*, L.

1. H. BIRMANICUM, Kurz in Journ. As. Soc. Beng. 1872. 309.

HAB. Frequent in the upper dry forests of the highest crests of the Pegu Yomah, on and around the Kambala-toung, at 2500 to 3000 ft. elevation.—Fl. Febr.

This plant forms a very conspicuous feature on the ridges referred to, but, unfortunately, all the specimens were so perfectly dried-up and withered that it was impossible to give a full description of the species. It is nearest to *Heracleum* No. 5 of Hf. and Th. collection from the Khasi hills and eventually may be referable to it.

### *Coriandrum*, L.

\*1. C. SATIVUM, L. sp. pl. 367; DC. Prod. IV. 250; Wight Icon. t. 516.

HAB. Ava, on Taong dong (Wall.) and Bhamo (J. Anderson), most probably only cultivated.—Fl. Fr. Nov. Febr.

### *Daucus*, L.

\*1. D. CAROTA, L. sp. pl. 348; DC. Prod. IV. 211; Roxb. Fl. Ind. II. 90.

HAB. Only cultivated, especially in European kitchen-gardens of the drier districts.

## ARALIACEÆ.

### *Conspectus of Genera.*

*Trib. 1. ARALIEÆ.* Petals more or less imbricate, broad at the base.

ARALIA. Gynœcium 2—5-merous. Styles free. Fruit angular in a dried state. Pedicels jointed. Leaves usually pinnate or decomposed.

*Trib. 2. HEDEREÆ.* Petals valvate in bud.

\* *Stamens as many as petals.*

× Albumen homogeneous. (*Panaceæ*.)

+ Ovary 2- (rarely 1-, 3-, or 4-) celled, the cells usually fewer in number than the petals.

† Styles distinct from the base or from a conical base.

PANAX. Fruits laterally compressed or didymous, rarely 3—4-angular. Filaments filiform. Styles distinct, at length recurved, the stigmas more or less decurrent on the

inner side. Umbels, heads, or racemes forming compound inflorescences, rarely simple. Leaves various.

† † Styles united into a cone or column.

BRASSAIOPSIS. Flowers 5-merous. Fruits torate. Ovary 2—1-celled. Pedicels not jointed. Umbels forming large terminal racemes. Leaves palmatifid, rarely digitate.

+ + Ovary 5- or more- (rarely by abortion 3—4-) celled.

HEPTAPLEURUM. Flowers 5—6- (rarely 4- or 7—8-) merous. Drupes angled and ribbed in a dried state. Umbels, heads, or racemes forming large compound inflorescences. Pedicels not jointed.

TREYESIA. Flowers 8—12-merous. Drupes globular, sulcate or ribbed. Umbels paniced. Leaves palmatifid, digitate, or pinnate. Pedicels not jointed.

× × Albumen ruminant. (*Hedera*).

+ Ovary 1-celled.

ARTHROPHYLLUM. Pedicels not jointed. Umbels compound. Leaves pinnate or simple.

+ + Ovary 2- or rarely 3-celled.

† Pedicels not jointed with the calyx.

HETEROPANAX. Styles distinct, filiform. Umbels racemose, in panicles. Leaves pinnately decompound.

† † Pedicels jointed under the calyx.

MACROPANAX. Styles united into a cone or column. Umbels or heads forming panicles. Leaves digitate.

\* † Stamens numerous, and more numerous than the petals. Styles none or connate. Petals valvate or firmly cohering. (*Pleurandrea*).

TUPIDANTHUS. Petals firmly cohering into a thick mitro. Gynæcium poly- (up to 100-) merous. Leaves digitate.

### Aralia, L.

1. A. ARMATA, Seem. Journ. Bot. VI. 134. (*Panax armatum*, Wall. ap. G. Don. Gen. Syst. III. 386; Walp. Rep. II. 429).

HAB. Tenasserim, near Tavoy (Wall. Cat. 4933).—Fl. Aug.

### Panax, L.

#### Conspectus of Species.

Leaves decompoundly 3-pinnate, the segments spiny-serrate, ..... *P. fruticosum*.  
Leaves 1-foliolate, ..... *P. cochleatum*.

\*1. P. FRUTICOSUM, L. sp. pl. 1515; Roxb. Fl. Ind. II. 76; Wight Icon. t. 573. (*Nothopanax fruticosum*, Miq. Fl. Ind. Bat. I/1. 765).

HAB. Here and there cultivated in villages of Pegu and elsewhere.

### Brassaiopsis, Dcne. and Planch.

1. B. PALMATA, Kurz in Journ. As. Soc. Beng. 1870. 77. (*Panax palmatum*, Roxb. Fl. Ind. II. 74; *Araliopsis Andamanica*, Kurz in And. Rep. App. B. 9).

HAB. Chittagong (Roxb.); here and there in the tropical forests of the Andamans.—Fr. May, June.

**Heptapleurum, Gaertn.****Conspectus of Species.**

*Subg. 1. Heptapleurum*, Seem. Stigmas immersed on the ovary, dot-like.

Climber; leaves and inflorescence glabrous, ..... *H. venulosum*.

*Subg. 2. Agalma*, Miq. Styles united into an elongate column.

Leaflets on thick rather short petiolules, entire, ..... *H. glaucum*.

Leaflets on very long, slender petiolules, usually pinnati-lobed, ..... *H. hypoleucum*.

1. *H. VENULOSUM*, Seem. Journ. Bot. III. 80. (*Paratropia venulosa*, WA. Prod. I. 377; Wight Ill. t. 118; *Aralia digitata*, Roxb. Fl. Ind. II. 107).

HAB. Frequent in the mixed forests all over Burma from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. April, May.

2. *H. GLAUCUM*, Bth. and Hf. Gen. Plant. (*Agalma glaucum*, Seem. Journ. Bot. II. 299).

HAB. Not unfrequent in the damp hill-forests of the Martaban hills east of Tounghoo, from 6000 ft. elevation upwards.—Fr. March.

3. *H. HYPOLEUCUM*, Kurz For. Fl. Burm. I. 539.

HAB. Not unfrequent in the drier hill-forests of the Martaban hills east of Tounghoo, at 6000 ft. elevation and higher up; also Ava, Kakhien-hills (J. Anderson).

Very near allied to the preceding species.

**Trevesia, Vis.**

1. *T. PALMATA*, Vis. Mem. Acad. Torin. ser. 2. IV. 262, (*Gastonia palmata*, Roxb. Fl. Ind. II. 407; Bot. Reg. t. 894; *T. Burmanica*, T. Anders. in Proc. Agri. Hort. Soc. Ind. 1867. 20).

HAB. Common in the tropical forests all over Burma from Chittagong and Ava down to Tenasserim, up to 4000 ft. elevation.—Fl. March, April; Fr. June.

The leaves in this species vary very much in cut, the base of the lobes being often abruptly reduced to the midrib only.

**Arthrophyllum, Bl.**

1. *A. JAVANICUM*, Bl. Bydr. 879. (*A. ellipticum* Bl. l. c.; *A. Blumeana*, Zoll. and Mor. Syst. Verz. 41; Miq. Fl. Ind. Bat. I/l. 768).

HAB. In the tropical forests of the western coasts of South Andaman (Port Mouat).—Fl. Febr. March.

**Heteropanax, Seem.**

1. *H. FRAGRANS*, Seem. Fl. Vit. 114. in adnot. and Journ. Bot. IV. 297. (*Panax fragrans*, Roxb. Fl. Ind. II. 76).

HAB. Frequent in all leaf-shedding forests, from Chittagong and Ava to Pegu and Martaban, up to 3000 ft. elevation.—Fl. Jan. Febr.; Fr. May, June.

**Macropanax, Miq.**

1. *M. OREOPHILUM*, Miq. Fl. Ind. Bat. I/1. 764.

HAB. Not unfrequent in the hill-forests, especially the damper ones, of the Martaban hills east of Bhamo, above 4000 ft. elevation; Ava, Kakhien hills (J. Anderson).

**Tupidanthus, Hf. and Th.**

1. *T. CALYPTRATUS*, Hf. and Th. in Bot. Mag. t. 4908.

HAB. Arracan hills (Theobald).

**CORNACEÆ.***Conspectus of Genera.*

*Petals narrow-linear, valvate. Anthers basifix. Style elongate. Leaves alternate.*

**ALANGIUM.** Stamens usually 2 to 4 times the number of the petals. Ovary 1-celled. Albumen ruminato. Flowers clustered or fascicled.

**MARLEA.** Stamens as many as petals. Ovary 1—3-celled. Albumen homogeneous. Flowers cymose-panicled.

\* \* *Petals short, valvate. Anthers dorsifix. Style short.*

**CORNUS.** Petals 4. Ovary 2-celled, with a simple stigma. Leaves usually opposite.

**Alangium, Lamk.***Conspectus of Species.*

A tree, spiny-armed; petioles 6—8 lin. long; petals 10—6; filaments densely pilose at the base; bracts and bractlets broadly ovate, very deciduous, .. *A. decapetalum*.

A large climber, unarmed; petioles shorter; petals 6; filaments sparingly pilose at the base; bracts and bractlets linear-oblong, longer persistent, .... *A. Sundanum*.

1. *A. DECAPETALUM*, Lamk. Encycl. Dict. I. 174; DC. Prod. III. 203; WA. Prod. I. 72; Wight Icon. t. 194; Voigt Cat. Hort. Calc. 40 cum syn. (*A. hexapetalum*, Lamk. l. c.; DC. l. c.; WA. l. c. 326; Wight III. II. t. 96; Roxb. Fl. Ind. II. 502; *A. tomentosum*, Lamk. l. c.; DC. l. c.; Rheed. Hort. Malab. IV. t. 17.; *A. Lamarckii*, Bedd. Fl. Sylv. t. 215).

HAB. Burmah (according to Rev. Dr. Mason).—Fl. HS.

The above synonymy probably includes two different species. I suspect that Thwaites' *A. Lamarckii* is a climber. The calyx-tube is apparently sulcate-ribbed.

2. *A. SUNDANUM*, Miq. Fl. Ind. Bat. I/1. 772 and Suppl. Fl. Sumatr. 341.

Var. *α. MIQUELLANA*, flowers on pedicels  $\frac{1}{3}$ — $\frac{1}{2}$  in. long.

Var. *β. INSULARUM*, pedicels only 2—3 lin. long.

HAB. Var. *β.* In the tropical forests of the Andamans.—Fl. March, April.

**Marlea, Roxb.***Conspectus of Species.*

Petals about  $\frac{1}{2}$  in. long or shorter; anthers with a glabrous connective; leaves glabrous, .. *M. begoniæfolia*.

Petals nearly an inch long; anther-connective pilose and boarded; leaves puberulous beneath, .. *M. tomentosa*.

1. *M. BEGONIÆFOLIA*, Roxb. Corom. Pl. III. t. 283 and Fl. Ind. II. 261; DC. Prod. IV. 267; Bot. Reg. t. 61; Miq. Fl. Ind. Bat. I/1. 774; Dene. in Jacq. Voy. Bot. t. 83. (*Styrax Javanicum*, Bl. Bydr. 671).

HAB. Tropical forests of Martaban east of Tounghoo; Ava, hills east of Bhamo.—Fl. March.

2. *M. TOMENTOSA*, Endl. Gener. No. 6097 and Suppl. III; Hassk. in Flora 1844. 605; Miq. Fl. Ind. Bat. I/1 775. (*Diacarpium rotundifolium*, Hassk. in Bonpl. VII. 172).

HAB. Not unfrequent in the tropical forests of Martaban; Tenasserim, Thonggyeen.—Fl. March, April.

**Cornus, L.**

1. *C. OBLONGA*, Wall. in Roxb. Fl. Ind. I. 432; DC. Prod. IV. 272.

HAB. Frequent in the drier hill-forests of the Martaban hills east of Tounghoo, at 4000 to 7000 ft. elevation.—Fl. Fr. March.

**CAPRIFOLIACEÆ.***Conspectus of Genera.*

*Trib. 1. SAMBUCEÆ.* Corolla rotate or shortly tubular. Stigmas 3, sessile or on a very short style. Raphe introrse or lateral.

*VIBURNUM.* Ovary 1- rarely 2- or 3-celled. Berry by abortion 1-celled and 1-seeded. Leaves simple.

*SAMBUCUS.* Ovary 3—5-celled. Berry with 3 to 5 pyrenes. Leaves unpaired, pinnate or pinnatisect.

*Trib. 2. LONICERÆÆ.* Corolla-tube more or less elongate. Style filiform. Raphe extrorse.

*LONICERA.* Corolla tubular. Ovary and berry 2—3-celled, or the berry 1-celled by absorption of the septa.

*SCYPHIPHORA.* Corolla tubular-funnel-shaped, regular; ovary 2-celled, with a parietal 2-ovuled placenta protruding into the cells so as to form a spuriously 4-celled ovary; fruit a drupe.

**Viburnum, L.***Conspectus of Species.*

Leaves more or less stellately pubescent beneath; corymbs terminal, ..... *V. fastidum*.  
Leaves glabrous; corymbs usually on axillary short branchlets; berries about 2 lin.

long, broadly ovate, ..... *V. Colebrookeanum*.

As preceding, but berries nearly 4 lin. long, elliptically oblong; corymbs terminal,

.. *V. lutescens*.

1. *V. FETIDUM*, Wall. Cat. 466 and Pl. As. Rar. I. 49. t. 61; DC. Prod. IV. 325; Hf. and Th. in Linn. Proc. II. 175.

Var.  $\beta$ . *PREMNACEA*, Hf. and Th. l. c. (*V. premnaceum*, Wall. Cat. 461; DC. Prod. l. c.), corymb involucred by 3 or 4 small leaves, rest as in the typical form.

Var.  $\gamma$ . *GRIFFITHIANUM*, all parts more robust and more densely stellate-pubescent; leaves about 4 in. long, acuminate, 6—7-nerved on each side, the lower nerves not meeting at the base (in varr.  $\alpha$ . and  $\beta$ . the leaves are trinerved at the base and, besides, have only 2—3 lateral nerves on each side). Most probably a good species.

HAB. Var.  $\alpha$ . Ava, Taong-dong (Wall.); Var.  $\gamma$ . Burma, probably Ava (Griff. 3403).—Fr. Nov.

2. *V. COLEBROOKEANUM*, Wall. Cat. 460; DC. Prod. IV. 327.

HAB. Ava, Kakhien hills; probably Hookhoom valley (Griff. 3398).

### *Sambucus*, L.

1. *S. THUNBERGIANA*, Bl. ap. Miq. Ann. Mus. Lugd. Bat. II. 265.—

HAB. Ava, Khakien hills (J. Anderson).—Fl. May.

Apparently well-distinguished from *S. adnata*, Wall., and occurs also in the Khasi hills.

### *Lonicera*, L.

1. *L. LEIANTHA*, Kurz in Journ. As. Soc. Beng. 1874. 188.

HAB. Ava, Kakhien hills (J. Anderson).—Fl. April.

### *Scyphiphora*, Gærtn.

1. *S. HYDROPHYLLACEA*, Gærtn. Fruct. III. 91. t. 196; DC. Prod. IV. 377. (*Epithinia Malayana*, Jack in Mal. Misc. I. 12; WA. Prod. I. 424; *Epithinia* sp. Griff. Not. Dicot. 269. t. 478 and (sub nom. *Lumnitzera*) t. 644. A).

HAB. Not unfrequent in the mangrove swamps of the Andaman islands.—Fl. May.

## *RUBIACEÆ.*

### *Conspectus of Genera.*

*Subd. 1. CINCHONEÆ.* Fruit a dehiscent capsule, dry or very rarely succulent, very rarely a berry or drupe and in this case the seeds always winged or appendaged. Ovary 2 to more-celled, with 1 to many ovules in each cell. Seeds various. Stipules interpetiolar.

*Ovules numerous in each cell. Capsule dry or more or less succulent.*

*Trib. 1. NAUCLEEÆ.* Flowers inserted upon a thickened receptacle and forming heads. Capsule dehiscing from the base or otherwise, dry or rarely (in *Sarcocophala*) berry-like.

× Capsule berry-like, dehiscing from the base. Trees.

**SARCOCEPHALUS.** Capsule 2-celled, or the 2 cells augmented by 2 superposed empty cells, more or less united in a fleshy syncarp.

× × Capsule dry, dehiscing loculicidally or septicidally into two many-seeded cocci. Trees or erect shrubs.

**NAUCLEA.** Flowers without bractlets. Capsule 2-celled. Trees or erect shrubs.

**STEPHEGYNE.** Flowers surrounded by angular-club-shaped bractlets. Capsule 3-celled. Trees.

**UNCARIA.** Flowers sessile or pedicelled, destitute of bractlets. Capsule dehiscing in longitudinal slits. Scandent hook-bearing shrubs.

*Trib. 2. EU-CINCHONÆ.* Flowers panicled or corymbose, never in heads. Capsule 2-celled, dehiscing septicidally into 2 valves or into 4 apical valves.

× Capsule septicidally dehiscing into 2 woody valves.

+ Corolla imbricate.

**LUCULIA.** Calyx-limb deciduous. Stamens included. Corymbs terminal, without floral leaves. Trees.

+ + Corolla valvate.

**HYMENODICTYON.** Inflorescence furnished with conspicuous discoloured floral leaves. Trees.

× × Capsule dehiscing at the apex into 4 valves. Corolla valvate.

**HYMENOPOGON.** Inflorescence furnished with conspicuous discoloured floral leaves. Epiphytcal shrubs.

*Trib. 3. HEDYOTIDÆ.* Ovary 2—4-celled, the cells many- or few-ovuled, the ovules laterally attached. Capsule dehiscing in various ways or separating into 2—4 cocci, rarely indehiscent.

× Stipules connate or free, neither sheathing nor setaceously fringed (*Rondeletiæ*).

+ Stigma 2-lobed or 2-cleft. Corolla imbricate or twisted. Anther-cells blunt.

**WENDLANDIA.** Corolla tubular, twisted. Capsule opening into two apical valves. Trees or shrubs.

**SPIRADICLIS.** Corolla-tube short. Capsule dehiscing into two valves which again separate into 2 valves inflexed with their margins. Erect herbs.

**OPHIORRHIZA.** Corolla funnel-shaped or tubular. Placenta free, erect. Capsule compressed, divaricately 2-lobed, opening loculicidally by an apical slit. Herbs.

+ + Stigma capitate. Corolla valvate. Anther-cells prolonged into a setaceous sterile appendage.

**ARGOSTEMA.** Corolla almost rotate, the limb 3—5-cleft. Anthers dehiscing longitudinally or by 1 or 2 apical pores. Capsule dehiscing by 4 apical valves. Herbs of the habit of *Sonerila*.

× × Stipules adnate to the petiole and sheathing at the base, setaceously fringed. (*Eu-Hedyotideæ*.)

**DENTELLA.** Flowers 5-merous, the petals 2- or 3-toothed. Capsule indehiscent.

**HEDYOTIS.** Flowers 4—5-merous, the petals entire. Capsule dehiscing loculicidally or septicidally, rarely almost indehiscent.

**SCLEROMITRION.** As preceding, but capsule separating into 2 or 4 several-seeded cocci.

\* \* *Ovules and seeds solitary in each cell.*

*Trib. 4. SPERMACOCEÆ.* Capsules distinct, dehiscing, or separating into cocci.

rarely indehiscent. Flowers not in heads. Corolla without toothlets between the lobes. Corolla valvate. Radicle inferior.

**SPERMACEÆ.** Ovule attached to or below the middle of the cell. Capsule dehiscing septically from the apex. Herbs.

**HYDROPHYLAX.** As preceding, but capsules indehiscent. Herbs.

**KNOXIA.** Ovule attached at or below the summit of the cell. Capsule dehiscing from the base into two deciduous cocci, leaving the persistent setaceous axis. Herbs.

**Trib. 5. CEPHALANTHÆÆ.** Capsules indehiscent, usually united into a syncarp. Corolla imbricate. Radicle superior.

**CEPHALANTHUS.** Corolla-lobes with toothlets in their sinuses. Capsules berry-like, connate. Flowers in heads.

**Subord. II. EU-RUBIACEÆ.** Fruit a more or less fleshy drupe or rarely a berry 1 to many-celled. Ovary-cells 1 to many-ovuled. Seeds never winged nor appendaged. Stipules interpetiolar or developed into leaves, or rarely none.

\* *Stipules interpetiolar, various.*

+ Seeds enclosed in pyrenes of a coriaceous, crustaceous, or chartaceous texture. Ovules solitary in each cell. Radicle inferior.

**Trib. 1. PADERIEÆ.** Ovule and the seed pendulous. Drupe dry, crustaceous or chartaceous, irregularly rupturing.

**PADERIA.** Corolla valvate. Cocci thin-chartaceous, expanded into wings. Twiners, the leaves opposite or whorled.

**Trib. 2. COFFEEÆ.** Ovary 2—9- (very rarely 1-) celled, the solitary ovules erect or attached to the middle of each cell. Berry consisting of 2 or more (rarely a single) one-seeded coriaceous or chartaceous pyrenes.

\* *Ovules erect and basal. Albumen often fleshy. Corolla valvate.*

× Ovary 4—9- (rarely 2-) celled. (*Lasiacanthææ*).

**IASIANTHUS.** Calyx more or less toothed. Styles and ovary-cells 4—9. Flowers clustered or cymose, axillary. Shrubs.

× × Ovary 2- (very rarely 1-) celled. (*Psychotriacæ*).

**NERTALIA.** Flowers hermaphrodite or unisexual. Corolla 4- or 5-lobed. Style 2-parted almost to the base, hirsute. Creeping herbs.

**CEPHALIS.** Corolla funnel-shaped, the tube long. Calyx 4- or 5-toothed or -lobed. Flowers in heads or solitary, axillary. Herbs or under-shrubs.

**HYDNOPHYTUM.** Calyx-limb entire. Corolla-tube short. Flowers sessile, clustered. Epiphytical shrubs with tuberous trunks.

● **PSYCHOTRIA.** Corolla-tube short, the throat bearded. Pyrenes flat or entire on the inner face. Flowers cymose or cymosely paniced. Shrubs, rarely scandent.

**CHASALIA.** Corolla-tube elongate, the throat naked. Pyrenes curved out on the inner face along the central placenta. Inflorescence of *Psychotria*. Shrubs or under-shrubs.

**SAPROSA.** Corolla funnel-shaped, velvety, often almost oblique. Berry 1- rarely 2-seeded. Flowers terminal and axillary. Stipules free. Shrubs or trees.

● ● *Ovules attached to the middle or above the middle of the septum. Corolla twisted. Albumen often horny. (Ixoreæ).*

● **COFFEA.** Corolla funnel-shaped, the limb 4—7-parted. Berry 2 or rarely 1-seeded, the pyrenes chartaceous. Flowers terminal and axillary. Stipules free.

**IXORA.** Corolla salver- or nearly funnel-shaped, the limb 4- or 5-parted. Flowers corymbose or panicled, Stipules connate.

*Trib. 3. MORINDEÆ.* Ovary 2—4-celled, the solitary ovules attached to the middle or below the middle of the cell. Corolla valvate. Berries free or often united in a syncarp.

\* *Berries free, not connate.*

**GYNCHOTODES.** Calyx-limb truncate. Style 2-cleft. Ovary 4-celled. Flowers clustered, axillary. Scandent shrubs.

\* \* *Berries united into fleshy syncarps.*

**MORINDA.** Berries fleshy. Pyrenes appendaged. Trees or shrubs.

+ + Seeds free, not enclosed in distinct pyrenes.

*Trib. 4. VANGUERIÆ.* Ovary many-celled, the cells with a solitary pendulous ovule attached above the middle or near the apex of the cells. Fruit a drupe, the putamen 1 to many-celled. Albumen usually fleshy. Radicle superior.

\* *Corolla valvate. Ovule attached laterally or below the summit of the cell. (Eu-Vangueriæ).*

**VANGUERIA.** Stigma discoid. Ovary usually 5-celled.

**PLECTRONIA.** Ovary 2-celled, the stigma capitate, oblong or mitre-shaped. Drupe didymous or occasionally almost 1-celled by abortion.

\* \* *Corolla imbricate. Ovule suspended from the summit of the cell.*

**GUETTARDA.** Stigma simple, thick. Drupe globose, rather large, the putamen many-celled.

**POLYPHRAGMON.** Stigmas as many as ovary-cells. Berry 5—10-celled, the seeds pyrene-like. Anomalous genus.

*Trib. 5. RANDIÆ.* Ovary 1-celled, with parietal placentas or more usually 2- or more-celled, with numerous ovules in each cell.

\* *Corolla imbricate or twisted.*

× Ovary 1-celled, with 4 or 5 parietal placentas. (*Gardeniæ*).

**GARDENIA.** Flowers often conspicuous. Stigma entire, sulcate-twisted. Berry usually large, many-seeded, the seeds imbedded in pulp.

× × Ovary 2-celled (*Eu-Randiæ*).

**RANDIA.** Stigma 2-lobed; style thickened spindle-like. Berry large, the seeds imbedded in pulp. Trees or shrubs, erect.

**GRIFFITHIA.** Stigma 2-lobed; style not thickened. Berries small, not pulpy. Scandent shrubs, often armed.

**WEBERA.** Stigma simple; style not thickened, filiform. Berries small, not pulpy. Erect trees or shrubs, unarmed.

**DIPLOSPORA.** Style 2-cleft. Berries rather large, not pulpy. Seeds in 2 rows in each cell. Erect trees or shrubs, unarmed. •

**HYPOBATHRUM.** Styles 2-lobed. Berry small, stalked or sessile, not pulpy. Seeds in a single row in each cell. Erect shrubs or trees.

• **BRACHYTOME.** Flowers polygamously dioecious. Corolla funnel-shaped, glabrous. Style shortly 2-lobed. Berry small, not pulpy. Seeds very numerous. Erect shrubs.

**MORINDOPSIS.** Flowers dioecious, in peduncled heads. Calyx-limb cupular or 4-toothed. Corolla-throat villous. Style hirsute. Berry elongate, cylindrical, the numerous seeds imbricately pendulous, almost appendaged. Trees.

\* \* *Corolla valvate.*

× Ovary 2-celled, the placentas 2-cleft. Corolla reduplicate-valvate. (*Mussandæ*).

MUSSÆNDA. The one or other calyx-lobe of the outer flowers extended into a discoloured leaf. Connective not mucronate. Style-branches 2.

ACRANTHERA. Calyx-teeth all conform, not appendaged. Connective mucronate-produced. Stigma clavate.

× × Ovary usually 5—6- (rarely 2—3-) celled, the placentas simple.  
(*Urophyllææ*.)

ADENOSACME. Calyx 5—4-cleft. Corolla-throat naked. Ovary 5—3-celled. Cymes or corymbs terminal or nearly so, rarely lateral.

MYRIONEURON. As preceding, but ovary 2-celled.

UROPHYLLUM. Calyx entire or minutely toothed. Corolla-throat bearded. Flowers clustered or cymose, axillary.

\* \* *Stipules transformed into leaves and forming whorls, or rarely the leaves opposite and the stipules wanting.*

Trib. 6. *STELLATÆ*. Calyx entirely adnate to the calyx or the calyx-limb 4—6-cleft. Corolla valvate. Ovary 2-celled, the ovules solitary, erect or ascending. Drupe indehiscent, dry or sappy, often didymous.

RUBIA. Flowers 5-merous. Drupe sappy. Erect or twining herbs.

GALIUM. Flowers 4-merous. Drupe usually didymous or globose, dry. Herbs or under-shrubs.

### **Sarcocephalus, Afz.**

#### **Conspectus of Species.**

Subg. 1. *Eu-Sarcocephalus*. Capsules succulent and connate, 2-celled throughout. All parts glabrous, the young branchlets pruinous; leaves more or less acuminate,  
.. *S. Cadamba*.

Subg. 2. *Anthocephalus*. Capsules less succulent, not connate, 2-celled with 2 superposed spurious sterile cells.  
Young shoots glabrous or pubescent; leaves more or less blunt,..... *S. cordatus*.

1. *S. CADAMBA*, (*Anthocephalus Cadamba*, Miq. Fl. Ind. Bat. II. 135; Bedd. Fl. Sylv. t. 35; *Nauclea Cadamba*, Roxb. Fl. Ind. I. 513).

HAB. In the moister upper mixed forests of the eastern slopes of the Pegu Yomah, descending into the lower mixed forests.—Fl. Decb.

2. *S. CORDATUS*, Miq. Ind. Bat. II. 133; Bedd. Fl. Sylv. t. 318. (*Nauclea cordata*, Roxb. Fl. Ind. I. 509; *Nauclea coadunata*, Sm. in Rees. Cycl. XXIV; DC. Prod. IV. 344; *Nauclea Wallichiana*, R. Br. in Wall. Cat. 6098; Don. Gen. Syst. III. 467).

Var.  $\alpha$ . GLABRA, leaves and all other parts quite glabrous.

Var.  $\beta$ . PUBESCENS, leaves beneath, petioles, stipules, and peduncles shortly and softly pubescent.

HAB. Both varieties frequent in the mixed forests (especially the lower ones) and in the savannahs, all over Pegu and Martaban down to Tenasscrim.—Fl. May.

**Nauclea, L.***Conspectus of Species.*

*Subg. 1. Eu-Nauclea.* Corolla slightly imbricate in bud. Flowers without bractlets. Flowers solitary or by threes, terminal.

\* All parts (at least the leaves) glabrous.

Leaves acuminate, the petiole  $\frac{1}{2}$ —1 in. long; flower-heads often by threes,

... *N. excelsa*.

Leaves blunt, almost sessile; flower-heads solitary, ..... *N. sessilifolia*.

\* \* All parts more or less pubescent.

Leaves cordate, petioled; flower-heads by 1—3, axillary, ..... *N. cordifolia*.

*Subg. 2. Adina, Salisb.* Corolla valvato. Flowers surrounded by bractlets.

\* Flower-heads small, paniced.

All parts glabrous; leaves petioled, ..... *N. polycephala*.

\* \* Flower-heads larger, paniced. Bractlets angular-club shaped.

× Petiole very slender and thin; leaves thin-membranous, acute at the base.

Bractlets only half as long as the calyx; corolla-lobes about  $\frac{1}{2}$  the length of the corolla-tube; flower-heads more constantly solitary between 2 floral leaves,

.. *N. parvifolia*.

Bractlets as long as the calyx; corolla-lobes about  $\frac{1}{2}$  the length of the tube; floral leaves very deciduous, the flower-heads soon forming dichotomous divaricate panicles, ..... *N. diversifolia*

× × Petiole very thick and pubescent; leaves large, cordate at the base.

Flower-heads dichotomously paniced; leaves wrinkled above; corolla-lobes as long as the short tube, ..... *N. rotundifolia*.

1. *N. EXCELSA*, Bl. Bydr. 1009; Miq. Fl. Ind. Bat. II. 139. (*N. peduncularis*, Wall. Cat. 6091; Don. Gen. Syst. III. 469; Bedd. Icon. t. 235?).

HAB. Pegu Yomah, at Myodwine (Dr. Brandis).—Fl. Octob.

2. *N. SESSILIFOLIA*, Roxb. Fl. Ind. I. 515. (*N. sericea*, Wall. Cat. 6095; Don. Gen. Syst. III. 467).

HAB. Frequent in the mixed forests, especially the upper ones, and in the savannahs, all over Pegu; also Chittagong.—Fl. end of RS.; Fr. Decb., Jan.

3. *N. CORDIFOLIA*, Roxb. Corom. Pl. I. t. 53 and Fl. Ind. ed. Wall. II. 122; DC. Prod. IV. 346; WA. Prod. I. 391. (*Adina cordifolia*, Bth. and Hf. in Brand. For. Fl. 263. t. 33; Bedd. Fl. Sylv. t. 33).

HAB. Frequent in the leaf-shedding forests, especially the lower ones, but also in the low and dry forests, from Ava and Martaban to Prome and Pegu, up to 1500 ft. elevation.—Fl. HS.; Fr. Begin of CS.

4. *N. POLYCEPHALA*, Wall. Cat. 6100; Don. Gen. Syst. III. 467. (*Adina polycephala*, Bth. Fl. Hongk. 146; Miq. in Ann. Mus. Lugd. Bat. III. 183; *N. aralioides*, Miq. Fl. Ind. Bat. II. 344).

HAB. Chittagong (Hf. and Th.); Tenasserim (Griff. 2751).

5. *N. PARVIFOLIA*, Roxb. Corom. Pl. I. 40. t. 82. and Fl. Ind. I. 513; DC. Prod. IV. 344.; Wight Ill. t. 123.—(*Stephegyne parvifolia*, Korth. in Verh. Nat. Gesch. Bot. 161; Bedd. Fl. Sylv. t. 34).

Var. *α. GENUINA*, bractlets only half as long as the calyx; flower-heads more constantly solitary between 2 longer-persistent floral leaves.

Var. *β. DIVERSIFOLIA*, (*N. diversifolia*, Wall. Cat. 6096; Don. Gen. Syst. III. 467), leaves much larger, from 3 to 6 in. long, beneath more conspicuously pubescent; stipules pubescent; bractlets as long as the calyx.

Var. *γ. MICROPHYLLA*, leaves small, only 1—2 in. long, minutely and inconspicuously pubescent beneath; stipules glabrous; bractlets as long as the calyx.

HAB. Var. *α.* not yet found in Burma; var. *β.* frequent in the mixed forests and in savannahs, all over Burma from Ava and Martaban down to Upper Tenasserim; var. *β.* exclusively in the savannahs.—Fl. Sept., Oct. Fr. CS.

6. *N. ROTUNDIFOLIA*, Roxb. Fl. Ind. I. 516, non Bartl. (*N. Brunonis*, Wall. Cat. 6097; Don. Gen. Syst. III. 467).

HAB. Frequent in the mixed forests, especially the upper and lower ones, all over Pegu and Martaban down to Tenasserim; also Chittagong.—Fl. end of RS.; Fr. CS.

### *Uncaria*, Schreb.

#### *Conspectus of Species.*

\* *Capsule long-stalked. Leaves more or less pubescent beneath.*

Flowers large, the pedicels 1—2 lin. long, velvety; calyx  $\frac{1}{2}$  in. long; corolla hirsute,  
.. *U. ferruginea*.

Flowers almost sessile; calyx 2 lin. long; corolla velvety, ..... *U. sessilifolia*.

\* \* *Capsule sessile.*

× Calyx-limb long-toothed.

All parts more or less woolly pubescent, ..... *U. pilosa*.

× × Calyx almost truncate or obscurely 5-toothed. Leaves glabrous.

Leaves green on both sides; corolla glabrous, ..... *U. laevigata*.

Leaves glaucous beneath; corolla-lobes velvety, ..... *U. sessilifructus*.

1. *U. FERRUGINEA*, DC. Prod. IV. 348. (*U. speciosa*, Wall. Cat. 6106).

HAB. Tropical forests of the eastern slopes of the Pegu Yomah, as in the Choungmenah valley (Khaboung), rare; Tenasserim, apparently frequent.

2. *U. SESSILIFOLIA*, Roxb. in Wall. Cat. 6107 and Icon. ined. XVIII. t. 79.

HAB. Tropical forests in the Choungmenah valley (Khaboung) of the eastern slopes of the Pegu Yomah, rather rare; Tenasserim, Tavoy (Wall. Cat. 6106. B).—Fl. Sept., Oct., Fr. March.

Roxburgh's figure represents the leaves as almost sessile. Is Wallich's identification with the above correct?

3. *U. PILOSA*, Roxb. Fl. Ind. ed. Wall. II. 130; DC. Prod. IV. 348.

HAB. Not uncommon in the tropical forests of the Pegu Yomah and from Martaban down to Tenasserim; also Ava hills.—Fl. begin of RS.; Fr. Nov., Dec.

4. *U. LÆVIGATA*, Wall. Cat. 6111.

HAB. Rare in the tropical forests of the Choungmenah valley (Khaboung) of the eastern slopes of the Pegu Yomah; Tenasserim, Amherst (Wall.)—Fl. Febr.

5. *U. SESSILIFRUCTUS*, Roxb. Fl. Ind. I 520; DC. Prod. IV. 349.

HAB. Tropical forests of Pegu and Tenasserim; Ava, Khakyen hills (J. Anderson).—Fr. Nov., Dec.

#### *Luculia*, Sw.

1. *L. GRATISSIMA*, Sweet Brit. Fl. Gard. t. 145; DC. Prod. IV. 358; Bot. Mag. t. 3946; Lodd. Cab. t. 1919.—(*Cinchona gratissima*, Wall. in Roxb. Fl. Ind. II. 154 and Tent. Fl. Nepal. I. 30. t. 21).

HAB. Ava, hills east of Bhamo (J. Anderson).—Fl. Sept.

#### *Hymenodictyon*, Wall.

1. *H. THYRSIFLORUM*, Wall. in Roxb. Fl. Ind. II. 151; DC. Prod. IV. 358. (*Cinchona thyrseiflora*, Roxb. Fl. Ind. I. 529; *H. Horsfieldii*, Miq. Fl. Ind. Bat. II. 158).

HAB. Rather rare in the upper mixed forests of the Pegu Yomah, but frequent in the dry forests of Prome; also Chittagong.—Fl. Aug.; Fr. CS.

#### *Hymenopogon*, Wall.

1. *H. PARASITICUS*, Wall. in Roxb. Fl. Ind. II. 156; DC. Prod. IV. 351.

HAB. Epiphytic on mossy trees of the upper dry forests on the Kam-bala ridges of the Pegu Yomah, at about 3000 ft. elevation.—Fr. CS.

#### *Wendlandia*, Bartl.

##### *Conspectus of Species.*

*Subg. 1. Wendlandia.* Flowers 5-merous, sessile or shortly pedicelled, in short spikelets, racemes, or clusters, forming thyrseoid panicles.

\* *Calyx-teeth short, triangular-acute.*

All parts and leaves on both sides harshly and shortly pubescent, ..... *W. scabra*.  
Leaves beneath more or less shortly pubescent or almost glabrescent; panicles pubescent or tomentose, ..... *W. tinctoria*.

All parts (also the panicle) quite glabrous; flowers minutely pedicelled, .. *W. glabrata*.

\* \* *Calyx-teeth subulate-acuminate, as long as or longer than the calyx-tube.*

Leaves coriaceous, glabrous, ..... *W. ligustrina*.

Leaves lanceolate, membranous, appressed pubescent on the midrib beneath,

... *W. glomerulata*.

*Subg. 2. Greenia*, WA. Flowers 4- or 5-merous, in one-sided spikes, forming divaricate corymbose panicles.

All parts glabrous; flowers 5—4-merous, ..... *W. secunda*.

All parts more or less tawny pubescent; flowers 4-merous, ..... *W. corymbosa*.

1. *W. SCABRA*, Kurz in Journ. As. Soc. Beng. 1872. 310.

HAB. Ava, hills east of Bhamo (J. Anderson).—Fr. May.

2. *W. TINCTORIA*, DC. Prod. IV. 411; Miq. Fl. Ind. Bat. II. 158. (*Rondeletia tinctoria*, Roxb. Fl. Ind. ed. Wall. II. 134).

HAB. Frequent in the open and dry forests, ascending into the drier hill-forests up to 4000 ft. elevation, from Ava and Martaban down to Tenasserim.—Fl. Febr., March; Fr. March, April.

3. *W. GLABRATA*, DC. Prod. IV. 411; Miq. Fl. Ind. Bat. II. 158.

HAB. In the drier hill-forests of the Martaban and Tenasserim hills, at 2000—4000 ft. elevation.—Fl. March.

4. *W. LIGUSTRINA*, Wall. Cat. 6272; Walp. Rep. II. 505.

HAB. Ava, Taong dong (Wall.) and Kakhien hills east of Bhamo (J. Anderson); Tenasserim (Helfer), a variety with longer corolla-tube.—Fl. Nov.; March.

5. *W. GLOMERULATA*, Kurz in Journ. As. Soc. Beng. 1872. 310.

HAB. Tenasserim, Mergui (Helfer).

6. *W. SECUNDA*, Griff. Not. Dicot. 266. (*Greenia Wightiana*, WA. Prod. I. 404; Wight Icon. t. 1161).

HAB. Tenasserim, Mergui, in forests near Culweng (Griff.).—Fl. Aug.

7. *W. CORYMBOSA*, DC. Prod. IV. 413. (*Rondeletia corymbosa*, Jack in Mal. Misc. I. No. 1. 4.; *W. spicata*, DC. l. c.; *Rondeletia spicata*, Wall. in Roxb. Fl. Ind. II. 139; *Greenia Jackii*, WA. Prod. I. 404, in adn.).

HAB. Tenasserim (Helfer 2843).

### Spiradiclis, Bl.

#### Conspectus of Species.

Stems, petioles, and inflorescence shortly pubescent; capsulo globular 2-lobed,

... *S. bifida*.

All parts quite glabrous; capsulo oblong, ..... *S. cespitosa*.

1. *S. BIFIDA*, Kurz in Journ. As. Soc. Beng. 1872. 310. (*Pleotheca? bifida*, Wall. Cat. 6216; Hf. in Bth. and Hf. Gen. pl. II. 62).

• HAB. Martaban hills, rare along chouns.

2. *S. CÆSPITOSA*, Bl. Bydr. 975; DC. Prod. IV. 418. (*S. cylindrica*, Hf. in Bth. and Hf. Gen. plant. II. 62).

• HAB. Rare along chouns in the hills of Martaban.

**Ophiorrhiza, L.****Conspectus of Species.**

*Cymes all terminal, on peduncles 1—3 in. long. Calyx-teeth short, triangular.*

× Bractlets conspicuous, subulate, up to a line long.

All parts glabrous; leaves long-acuminate, ..... *O. gracilis*.

× × Bracts subulate, usually persistent, but the bractlets very minute if any.

All parts (also the capsule) glabrous, ..... *O. Mungos*.

Stems and petioles brown-pubescent; leaves thick-membranous, whitish beneath; capsule glabrous, ..... *O. argentea*.

As preceding, but leaves only pale-coloured beneath, the inflorescence more hispid-pubescent; capsule minutely hispid, ..... *O. villosa*.

\* \* *Cymes terminal and axillary, on very short peduncles only 4—6 lin. long, or almost sessile. Calyx-teeth lanceolate, acute.*

Stem, petioles and peduncles more or less shortly pubescent; lateral branches all shortened, ..... *O. erubescens*.

1. *O. GRACILIS*, Kurz in Journ. As. Soc. Beng. 1872. 311.

HAB. Tenasserim, Attaran (Brandis).

2. *O. MUNGOS*, L. Amæn. Acad. II. 127; Roxb. Fl. Ind. I. 901; DC. Prod. IV. 414; Miq. Fl. Ind. Bat. II. 166.

Var. *α. GENUINA*, capsule about 3 lin. across, emarginate, the lobes somewhat acute.

? Var. *β. ORTHOCARPA*, capsule about 2 lin. across, truncate at the apex, the lobes blunt or almost truncate.

HAB. Var. *β.* only, Martaban hills, at 3000 ft. elevation (Dr. Brandis).

Dr. Brandis' specimens are not sufficient to enable one to make out whether they should not rather form a distinct species. The true Linnean species is a sea-shore plant, growing chiefly in the beach-forests, most probably also growing along the Burmese coasts.

3. *O. ARGENTEA*, Wall. Cat. 6229; Walp. Rep. II. 503.

HAB. Chittagong; Arracan, on sandstone rocks in the tropical forests of Boronga island.—Fl. Fr. Octob.

Probably not sufficiently distinct from *O. canescens*, Bl.

4. *O. VILLOSA*, Roxb. Fl. Ind. ed. Wall. II. 546; DC. Prod. IV. 415. (*O. rugosa* Wall. in Roxb. Fl. Ind. II. 546; DC. l. c. 416; Miq. in Ann. Mus. Lugd. Bat. IV. 232; *O. hispidula*, Wall. Cat. 6234; Don. Gen. Syst. III. 523; *O. trichocarpa*, Bl. Bydr. 977; Miq. Fl. Ind. Bat. II. 173).

HAB. Frequent in the tropical forests, from Chittagong and Ava down to Tenasserim and the Andamans. Fl. April, June; Fr. Aug., Sept.

5. *O. ERUBESCENS*, Wall. Cat. 6233; Don. Gen. Syst. III. 522.

HAB. Not uncommon in the hill-forests of Martaban and Tenasserim (Chappedong-hills, Wall.) at 3000 to 5000 ft. elevation.—Fl. March.

**Argostema**, Wall.*Conspectus of Species.*\* *Flowers 5-merous.*

- × Leaves reduced to bract- or stipule-like leaflets, of which only 1 or 2 are fully developed.

All parts glabrous; leaf solitary; anthers oblong, blunt, ..... *A. unifolium*.

Umbels stiff-hairy; leaves two, ..... *A. Tavoyana*.

- × × Leaves all developed but very unequal, whorled, or crowded at the apex of the stem.

Glabrous or nearly so; anthers free, linear, acuminate, opening by terminal poros,

.. *A. verticillatum*.

\* \* *Flowers 4-3-merous.*

Stem, inflorescence, and petiole villous-pubescent; leaves sparingly pubescent, cordate, bluntish or acute; flowers in peduncled umbels or cymose umbels, ... *A. soneriloides*.

Quite as preceding, but flowers solitary on a short pedicel, or by 2 or 3 on a very short peduncle, pale rose-coloured, ..... *A. oligantha*.

1. *A. UNIFOLIUM*, Benn. in Horsf. Plant. Jav. rar. 94; Miq. Fl. Ind. Bat. II. 161.

HAB. Upper Tenasserim, Moulmein and Attaran (R. Scott, Dr. Brandis).—Fl. July.

In my specimens the anthers are blunt and not beaked as Bennet describes them.

2. *A. TAVOYANUM*, Wall. ap. Benn. in Horsf. Pl. Jav. rar. 95.

HAB. Tenasserim, Tavoy (Wall.). Unknown to me.

3. *A. VERTICILLATUM*, Wall. in Roxb. Fl. Ind. II. 325.

HAB. Tenasserim, Moulmein (Rev. Parish, R. Scott).—Fl. July..

4. *A. SONERILOIDES*, Kurz in Journ. As. Soc. Beng. 1872.

HAB. Pegu, abundant on the pagodas of Rangoon (R. Scott).—Fl. July, Aug.

5. *A. OLIGANTHA*, Kurz MS.

HAB. On damp rocks in the coast-forests of South Andaman (Watering Cove).—Fl. June.

A small species of *Argostema*, with slightly pubescent leaves solitary or by pairs, occurs on damp rocks of the tropical forests on Boronga island, Arracan, but the specimens are too few and reduced to admit of description. Its calyx-lobes are blunt or rather retuse.

**Dentella**, Forst.

1. *D. REPENS*, Forst. Gen. 26. t. 13; DC. Prod. IV. 419; Roxb. Fl. Ind. I. 532; Miq. Fl. Ind. Bat. II. 196. (*Lippaya telephioides*, Endl. Atakt. 13. t. 13).

HAB. Common in agrarian lands and along river-banks, all over Burma from Chittagong and Ava down to Tenasserim and the Andamans (here introduced only).—Fl. Fr. ∞.

**Hedyotis, L.****Conspectus of Species.****\* Capsule loculicidally dehiscent.**

*Subg. 1. Oldenlandia, L.* Capsule more or less hemispherical or obsoletely 2-lobed, opening loculicidally. Annual, rarely perennial herbs.

\* *Prostrate or diffuse herbs. Flowers solitary, or in cymes or clusters in the axils of the leaves (rarely also terminal). Root sometimes turning perennial.*

× Leaves more or less oval, petioled.

Flowers solitary, sessile or nearly so. .... *H. tinervia*.

× × Leaves linear to narrow-linear, rarely lanceolate, more or less sessile.

+ Flowers solitary or by 2—3 on an axillary peduncle.

Flowers solitary, on very short strong pedicels; leaves membranous, flat,

... *H. ramosissima*.

Flowers by 2—3, rarely solitary, on a capillary peduncle; pedicels very long and capillary; leaves membranous, flat, ..... *H. biflora*.

+ + Flowers by 4 or more, forming axillary and terminal clusters or cymes. Leaves more or less revolute on their margins, somewhat rigid.

Flowers in peduncled cymes or the cymes umbel-like, ..... *H. umbellata*.

Flowers in sessile clusters, ..... *H. angustifolia*.

\* \* *Erect annuals. Flowers in terminal panicles or cymes, or solitary, rarely the inflorescence also axillary.*

× Leaves sessile or nearly so.

Leaves sagittate at the base, shortly bristly rough; flowers pale-blue, by 3—4 terminal, and also singly from the leaf-axils; pedicels long and capillary, ..... *H. linoides*.

Leaves linear; corolla about an inch long, brownish purple, ..... *H. gracilis*.

× × Leaves more or less petioled, more or less tapering at the base.

+ Calyx only  $\frac{1}{3}$ — $\frac{1}{2}$  lin. long.

All parts sparingly pilose; leaves acute; cymes peduncled, axillary and terminal; pedicels capillary, 3—4 lin. long, ..... *H. Wallichii*.

Stem villous-pubescent, the leaves often whorled at the end of the nude scape-like stem; cymes divaricate, peduncled, terminal; pedicels capillary, 2—4 lin. long,

... *H. spergulea*.

+ + Calyx  $\frac{1}{2}$ —2 lin. long. Flowers in racemes or cymes, terminal and in the axils of the upper-leaves.

Glabrous, more or less succulent; flowers slenderly pedicelled; capsule not winged, the crowning calyx-lobes very short, ..... *H. paniculata*.

Stems, and nerves beneath, shortly pubescent; flowers sessile or nearly so; capsule more or less compressed and winged, the crowning lobes nearly a line long.

... *H. Andamanica*.

\* \* **Capsules opening septically.**

*Subg. 2. Dimetia, WA.* Capsule opening septically at the apex by a gaping short slit, more or less truncately hemispherical and obscurely 2-lobed. Scandent, diffuse or erect perennials. Flowers in small heads, forming axillary and terminal peduncled cymes or panicles. Corolla often villous within.

Glabrous or pubescent; flowers sessile or nearly so; nerves of leaves prominent,

... *H. capitellata*.

Scandent or diffuse, quite glabrous, glaucous; flowers pedicelled; calyx-lobes acute,

... *H. scandens*.

Erect, branched, quite glabrous; flowers sessile; calyx-lobes broad and blunt, *H. elegans*.

*Subg. 3. Metabolas*, Bl. Capsule septically dehiscent or nearly so, hemispherical and more or less truncate at the apex, often obscurely 2-lobed. Diffuse or half-scandent, rarely erect perennials. Flowers in axillary (very rarely terminal) clusters or cymes.

\* *Flowers in axillary peduncled cymes. Prostrate or diffuse perennials.*

× Flowers pedicelled, in loose cymes.

All parts more or less pubescent; calyx-lobes longer than the tube, ..... *H. ulmifolia*.

All parts glabrous; calyx-teeth minute, ..... *H. glabra*.

× × Flowers sessile or nearly so, in little heads collected into peduncled cymes or clusters.

Flowers minute, pale blue; capsule only about  $\frac{1}{2}$  lin. across, ..... *H. costata*.

\* \* *Flowers sessile or very shortly pedicelled, in axillary or terminal clusters or heads.*

Prostrate or diffuse, all parts more or less pubescent; clusters axillary, ... *H. auricularia*.

Erect, slightly pubescent; clusters terminal, involucre by the 4 or 5 uppermost leaves,

... *H. scabra*.

1. *H. TRINERVIA*, Roem. and Schult, Syst. Veg. III. 197; Bedd. Icon. t. 29. (*Oldenlandia trinervia*, Retz. Obs. IV. 23; Miq. Fl. Ind. Bat. II. 189).

HAB. Chittagong (Hf. and Th.); Arracan, in grassy spots of the beaches near Akyab.—Fl. Fr. Decb.

2. *H. RAMOSISSIMA*, Spreng. Pugill. II. 32, non Bl. (*Oldenlandia brachypoda*, DC. Prod. IV. 424; Miq. Fl. Ind. Bat. II. 187; *Oldenlandia diffusa*, Roxb. Fl. Ind. I. 423).

HAB. Not unfrequent along the larger rivers, like Sittang, Irrawadi, etc., also in cultivated lands, from Ava down to Pegu and Martaban.—Fl. Fr. DS.

3. *H. BIFLORA*, Sm. in Rees Cycl. XVII. 15. (*Oldenlandia biflora*, L. sp. pl.; Roxb. Fl. Ind. I. 423; *Oldenlandia Burmanniana*, R. Br. in Wall. Cat. 868; Miq. Fl. Ind. Bat. II. 189; *Oldenlandia herbacea*, DC. Prod. IV. 425; Rth. Fl. Hongk. 151; *H. diffusa*, Willd. sp. pl. I. 566).

Var.  $\alpha$ . *GENUINA*, flowers by 2—3 on very slender pedicels.

Var.  $\beta$ . *UNIFLORA*, flowers solitary on a very slender pedicel.

Var.  $\gamma$ . *GRAMINICOLA*, (*H. graminicola*, Kurz in Trim. Journ. Bot. 1875. 326), leaves narrower and stiffer; flowers solitary on very slender axillary pedicels, or by twos and slenderly peduncled; corolla 2 lin. long or somewhat longer; style exserted.

Var.  $\delta$ . *CORYMBOSA*, (*Oldenlandia corymbosa*, L. Herb.; DC. Prod. IV. 426; *Oldenlandia ramosa*, Roxb. Fl. Ind. ed. Wall. II. 445; Wight. Icon. t. 822; DC. Prod. IV. 426), flowers by 2—3 and cymose umbellate by 3—7.

HAB. Common in agrarian lands on river-banks, along road-sides, &c., also in grassy spots in the leaf-shedding forests, all over Burma; var.  $\beta$ .

and δ. in agrarian and dry grass-lands of Ava and Pegu, also Andamans — Fl. Fr. ∞.

4. *H. UMBELLATA*, WA. Prod. I. 413. (*Oldenlandia umbellata*, L. sp. pl. 174; Roxb. Corom. Pl. I. t. 3 and Fl. Ind. I. 421; Miq. Fl. Ind. Bat. II. 191).

HAB. Burma, probably Ava (Griff. 2895/2).

5. *H. ANGUSTIFOLIA*, Cham. and Schlecht. in Linn. 1829. 153; DC. Prod. IV. 419. (*H. pinifolia*, Wall. Cat. 850; Don. Gen. Syst. III. 526).

HAB. Tenasserim, Amherst (Wall. Cat. 850 A).

6. *H. LINOIDES*, Griff. Not. Dicot. 265. (*H. arguta*, R. Br. in Wall. Cat. 864).

HAB. Tenasserim, Tavoy (Wall.); Mergui, in moist sandy places, near Culweng. (Griff.).—Fl. Octob.

7. *H. GRACILIS*, Wall. in Roxb. Fl. Ind. I. 377, non DC. (*H. stricta*, Wall. in As. Research. XIII. 369, non Sm.; *H. fusca*, Ham. in Don. Prod. Nep. 134; *H. aspera*, Heyne in Roth. Nov. sp. 93, cum syn.; *Kohautia* sp. Griff. Not. Dicot. 265. t. 477).

HAB. Ava, Irrawaddi valley at Katha, in savannas (Griff.).—Fl. May.

8. *H. WALLICHII*, Kurz in Journ. As. Soc. Beng. 1876. 136.

HAB. Not unfrequent in the eng- and hill-eng-forests from Martaban down to Tenasserim.—Fl. Fr. Octob.

9. *H. SPERGULACEA*, (*Oldenlandia spergulacea*, DC. Prod. IV. 428; *Oldenlandia ovalifolia*, Miq. Fl. Ind. Bat. II. 192, non DC.; *H. scapigera*, R. Br. in Wall. Cat. 881; *H. nudicaulis*, WA. Prod. I. 416; Bedd. Icon. t. 33).

HAB. Not unfrequent on rocky ground in the leaf-shedding forests, especially in the dry, eng-, and upper mixed ones, from Prome, Pegu, and Martaban down to Upper Tenasserim.—Fl. Fr. Sept.—Decb.

10. *H. PANICULATA*, (*Oldenlandia paniculata*, L. sp. pl. 1667; Roxb. Fl. Ind. I. 422; Bth. Fl. Hongk. 152; DC. Prod. IV. 427; *H. racemosa*, Lamk. Dict. III. 76 and Ill. t. 62. f. 2; Wight Icon. t. 312; *Oldenlandia alata*, Roxb. Fl. Ind. I. 421, non Koen.).

HAB. Frequent in rubbishy places, in garden and other cultivated land, along river-banks, &c., all over Burma.—Fl. Fr. Jan.—June.

11. *H. ANDAMANICA*, Kurz in Journ. As. Soc. Beng. 1872. 311.

• HAB. On moist sandstone rocks along choungs in the forests of the Andamans.—Fl. Fr. May, June.

A branched variety of this has the capsules more compressed and more keel-winged and the calyx-teeth still larger. As a species it is allied to *H. lanceafolia*, Dalz., and *H. alata*, L.

12. *H. CAPITELLATA*, R.Br. in Wall. Cat. 837; Walp. Rep. II. 494.

Var. *a.* *GENUINA*, (*Oldenlandia rubioides*, Miq. Fl. Ind. Bat. II. 353), all parts quite glabrous.

Var. *β.* *SUBPUBESCENS*, stems glabrous, the branchlets and the under-surface of the leaves minutely pubescent.

Var. *γ.* *PUBESCENS*, all parts densely pubescent, the leaves above roughish minutely, beneath softly and yellowish but shortly, pubescent; calyx-teeth often longer and larger.

HAB. Var. *a.* and *β.* from Martaban down to Tenasserim; also Ava, Kakhien hills; var. *γ.* not unfrequent in the hill-toungyas, and along choungs in the tropical forests of the Martaban and Tenasserim hills, up to 3000 ft. elevation.—Fl. Decb.—Febr.; Fr. Febr.

This species has been identified with *H. fruticosa* of Linne, but the Ceylon plant of this name is certainly distinct.

13. *H. SCANDENS*, Roxb. Fl. Ind. I. 364; DC. Prod. IV. 422.

HAB. Chittagong (Hf. and Th.); Ava, Kakhien hills (J. Anderson).—Fl. Decb.; Fr. Jan.—March.

14. *H. ELEGANS*, Wall. Cat. 887.

HAB. Not unfrequent in the drier hill-forests, especially the pine-forests, of the Martaban hills east of Tounghoo, at 4000—5000 ft. elevation; also Tenasserim, Tavoy (Wall.; Helf.).

N. B.\* Bentham (Fl. Hongk. 149) mentions doubtfully *H. loganioides*, Bth., as growing about Moulmein; possibly this species is meant? *H. loganioides*, with long calyx-lobes, occurs on Mt. Ophir near Malacca.

15. *H. ULMIFOLIA*, Wall. in Roxb. Fl. Ind. ed. Wall. I. 370; DC. Prod. IV. 421; (*H. lineata*, Don. Prod. Fl. Nep. 134).

HAB. In the drier hill-forests, especially in the pine-forests, of the Martaban hills east of Tounghoo, at 4000 to 6000 ft. elevation.—Fr. March.

16. *H. GLABRA*, Wall. Cat. 848; Miq. Fl. Ind. Bat. II. 133. (*Spermacoce glabra*, Roxb. Fl. Ind. I. 368).

HAB. Tenasserim (Helf. 2885).

17. *H. COSTATA*, (*Spermacoce costata*, Roxb. Fl. Ind. I. 370; *H. cærulea*, Korth. in Ned. Kruidk. Arch. II. 160, non L. ncc. WA.; *H. capituliflora*, Miq. Fl. Ind. Bat. II. 183; *Metabolos cæruleus*, Bl. Bydr. 992; DC. Prod. IT. 435).

HAB. In tropical forests, more especially along choungs and in shrubbery, of the southern parts of the Pegu Yomah above Rangoon; more frequent in Tenasserim.—Fr. Sept.

18. *H. AURICULARIA*, L. sp. pl. 147; DC. Prod. IV. 420; Bedd. Icon. t. 27. (*H. venosa*, Korth. in Ned. Kruidk. Arch. II. 160; Miq. Fl. Ind. Bat. II. 182; *Metabolos venosus*, Bl. Bydr. 991; *H. iodoneura*, Miq. l. c. 181; *H. lineata*, Roxb. Fl. Ind. I. 369, non Don).

HAB. Ava hills east of Bhamo (J. Anderson).—Fr. Octob.

19. *H. SCABRA*, Wall. Cat. 880.

HAB. Not unfrequent in the tropical forests from Martaban down to Upper Tenasserim.—Fl. Fr. April; Aug.

*Doubtful Species.*

1. *H. argentea*, Wall. Cat. 858; Walp. Rep. II. 502.

HAB. Ava, banks of the Irrawadi.

2. *H. Merguensis*, Hf. in Bth. and Hf. Gen. Pl. II. 57.

HAB. Tenasserim, Mergui (Griff.).

**Scleromitron, WA.**

*Conspcctus of Species.*

*Subg. 1. Eu-Scleromitron. (Fergusonia, Hf.?)* Capsule loculicidally separating into 2 many-seeded cocci. Calyx more or less obovoid, crowned by the converging calyx-limb. Stigmatic lobes 2. Diffuse perennials.

\* *Flowers in terminal sessile heads or clusters.*

Flower-heads half-included in the embracing bases of the involucre-like uppermost leaves; calyx-teeth large, ..... *S. coronarium*.

\* \* *Flowers in axillary clusters or heads.*

× All parts glabrous or nearly so.

Leaves linear, not nerved, quite glabrous; flowers in dense clusters; calyx-tube glabrous or nearly so; capsule glabrous or shortly hispid, ..... *S. rigidum*.

Leaves ovate to ovate-oblong; flowers by 2—3 or few in the leaf-axils; capsule glabrous, ..... *S. nitidum*.

× × All parts, more especially the stems and capsule, more or less shortly hispid.

All parts, also the leaves, shortly scabrous-pubescent; capsule ovoid, about a line long or longer, .. *S. hispidum*.

Stem shortly hispid; leaves glabrous above, minutely puberulous beneath; corolla half the size, pubescent at the throat; capsule globular (like in *Oldenlandia*), with short calyx-lobes, ..... *S. paradoxum*.

*Subg. 2. Tetragyneia*, Miq. (*Allaophania*, Thw.). Capsule separating into 2 cocci which again separate into twos. Stigmas or stigmatic lobes 4.

Stigmas capitate; leaves not rugose, sparingly hirsute above, ..... *S. decipiens*.

Stigmas linear, almost spreading; leaves rugose, above glabrous or nearly so, *S. rugosum*.

1. *S. CORONARIUM*, (*Hedyotis coronaria*, Wall. Cat. 856).

HAB. Tenasserim, Attaran (Brandis); Tavoy (Wall.)—Fl. Oct.

2. *S. TETRANDRUM*, (*Rondeletia tetrandra*, Roxb. Fl. Ind. I. 524; *Hedyotis macrophylla*, Wall. Cat. 841; Miq. l. c. 178; *Hedyotis nodiflora*, Wall. Cat. 855; Don. Gen. Syst. III. 526).

HAB. All over Tenasserim.—Fr. Febr.

3. *S. RIGIDUM*, (*Hedyotis rigida*, Miq. Fl. Ind. Bat. II. 181; *Meibolus rigidus*, Bl. Bydr. 992).

HAB. Tenasserim.—Fr. Febr.

4. *S. NITIDUM*, (*Hedyotis nitida*, WA. Prod. I. 412).

HAB. Not unfrequent in the eng-forests of Pegu and in those of Martaban east of Tounghoo.—Fr. CS.

Very probably only an extreme, broad-leaved form of *S. hispidum*, while *S. approximatum* (*Hedyotis approximate*, WA. ; *Spermacoce tubularis*, R. Br. ?) may be an extreme, narrow-leaved variety of it.

5. *S. HISPIDUM*, (*Hedyotis hispida*, Retz. Obs. Bot. IV. 23 ; Roxb. Fl. Ind. I. 364 ; DC. Prod. IV. 420 ; *Hedyotis* sp. Griff. Not. Dicot. 265 ; *Spermacoce* sp. Griff. l. c. 272).

HAB. Frequent along choungs in the moister upper mixed and the tropical forests, from Ava and Martaban to Pegu.—Fr. Jan.

6. *S. PARADOXUM*, (*Hedyotis paradoxa*, Kurz in Journ. As. Soc. Beng. 1876. 135).

HAB. Common in the moister upper mixed forests of the Andamans.—Fl. Fr. Jan.—March.

NB. *Allæophania decipiens*, Thw., is in my eyes a very near ally to *Scleromitrium rugosum* (*Hedyotis rugosa*, Korth.).

### **Spermacoce, L.**

#### *Conspectus of Species.*

Flowers in dense whorl-like clusters or heads, white, about a line long ; capsules 1 lin. long, ..... *S. stricta*.

Flowers 2—3 lin. long, blue, few-clustered ; capsule about 2 lin. long, .... *S. hispida*.

1. *S. STRICTA*, L. f. Suppl. 120 ; Roxb. Fl. Ind. ed. Wall. I. 376 ; DC. Prod. IV. 554 ; Miq. Fl. Ind. Bat. II. 331 ; Bth. Fl. Hongk. 162.

HAB. Frequent in the dry and open forests all over Ava and Pegu down to Upper Tenasserim.—Fl. RS. ; Fr. CS.

2. *S. HISPIDA*, L. Mant. 558 ; Roxb. Fl. Ind. ed. Wall. II. 379 ; WA. Prod. I. 438 ; Miq. Fl. Ind. Bat. II. 332. (*S. scabra*, Willd. sp. pl. I. 572 ; Roxb. Fl. Ind. l. c. 377).

Var. *a. HISPIDA*, whole plant hispid-pubescent, the leaves usually of a softer texture and undulate ; corolla-tube only  $1\frac{1}{2}$ -2 lin. long ; capsule greyish or whitish villous ; seeds opaque, black.

? Var. *β. ARTICULARIS*, (*S. articularis*, L. f. Suppl. 119 ; Roxb. l. c. 378 ; Miq. l. c. 332 ; *S. Avana*, R. Br. in Wall. Cat. 828 ; G. Don. Gen. Syst. III. 621 ; *S. longicaulis*, R. Br. in Wall. Cat. 826 ; G. Don. Gen. Syst. III. 621), whole plant more scabrous, and short pubescent, the leaves rigid and not undulate ; corolla-tube about 3 lin. long, slender ; capsule shorter and hispid ; seeds often glossy, black or brownish.

HAB. Var. *β.* only, frequent in agrarian land and on stony sterile grounds in the leaf-shedding forests, from Ava and Martaban down to Tenasserim, up to 1500 ft. elevation.—Fl. Fr. D. S.

**Knoxia, L.***Conspectus of Species.*

\* *Stem leafy, without radical leaves, more or less branched.*

Leaves petiolod; flowers spikod, forming corymbs, ..... *K. corymbosa*.

Leaves sessile or nearly so; flowers corymböse, forming corymbs, ..... *K. microcarpa*.

\* \* *Leaves all crowded at the base; stem scape-like, with narrow small cauline leaves only.*

More or less hairy while young; calyx-tube densely villous; corolla nearly  $\frac{1}{2}$  an inch long, ..... *K. plantaginea*.

1. *K. CORYMBOSA*, Willd. sp. pl. I. 582; WA. Prod. I. 439; Wight Atlas<sup>4</sup>: 128; Miq. Fl. Ind. Bat. II. 330. (*Spermacoce teres*, Roxb. Fl. Ind. ed. Wall. I. 373; *Spermacoce Sumatrensis*, Retz. Obs. IV. 23, non Roxb.).

HAB. Not unfrequent in the dry and eng-forests of Ava, and Prome, and also in Martaban east of Tounghoo.—Fl. March, April.

2. *K. MICROCARPA*, Kurz MS.

HAB. Not unfrequent in the eng and low forests of Pegu, especially the Irrawaddi zone; also in Martaban, as Yoonzeleen (Brandis); Zwa-Kabin (Parish).—Fl. Octob., Nov.; Fr. Dec., Jan.

There are specimens with a short wide corolla-tube and others with a slender tube nearly twice the length.

3. *K. PLANTAGINEA*, Wall. Pl. As. Rar. I. t. 32; Miq. Fl. Ind. Bat. II. 330.

HAB. In the dry and eng-forests of Prome as far south as Myodweng, but everywhere rare and sporadic.—Fl. Sept., Octob.; Fr. Octob.—Jan.

**Cephalanthus, L.**

1. *C. NAUCLEOIDES*, DC. Prod. IV. 539.—(*Nauclea tetrandra*, Roxb. Fl. Ind. ed. Wall. II. 125).

HAB. Burma, probably Ava hills (Griff.).

**Pæderia, L.***Conspectus of Species.*

\* *Ripe seeds not winged. Capsule globular.*

Glabrous or pubescent; corolla scurfy-tomentose or velvety outside, ..... *P. tomentosa*.

\* \* *Ripe seeds broadly winged. Capsule more or less compressed.*

× Corolla mealy or scurfy-tomentose or velvety outside.

Quite glabrous; calyx-lobes shorter than the calyx-tube; seed-wings pale-coloured, ..... *P. foetida*.

Sparingly and shortly puberulous; calyx-lobes longer than the tube; seed-wings blackish, ..... *P. calycina*.

× × Corolla not tomentose, but only sparingly and shortly pilose.

All softer parts, and more especially the undersurface of the leaves, villous-tomentose; seed-wings corky, pale-coloured, ..... *P. lanuginosa*.

1. *P. TOMENTOSA*, Bl. Bydr. 968; Miq. Fl. Ind. Bat. II. 258, and Ann. Mus. Lugd. Bat. IV. 254. (*P. barbulata*, Miq. in Ann. Mus. L. B. IV. 255; *P. densiflora*, Miq. Fl. Ind. Bat. II. 259; *P. foetida*, Bth. Fl. Hongk. 162 ?).

Var. *α*. *TOMENTOSA*, all parts more or less shortly pubescent or almost scurfy-pubescent.

Var. *β*. *GLABRA*, all parts glabrous or only sparingly and minutely pubescent on the nerves.

HAB. Arracan hills.—Fl. Fr. Octob.

2. *P. FETIDA*, L. Mant. 52; Roxb. Fl. Ind. ed. Wall. II. 517; WA. Prod. I. 424; Miq. Fl. Ind. Bat. II. 258. (*P. ovata*, Miq. in Ann. Mus. Lugd. Bat. IV. 255).

Var. *β*. *MICROCARPA*, capsule compressed ovoid-orbicular, only about 3 lin. long.

HAB. Not unfrequent in shrubbery, from Chittagong and Ava down to Upper Tenasserim; Var. *β*. on Taong dong in Ava (Wall.)—Fr. Nov.—Jan.

3. *P. CALYCINA*, Kurz in Journ. As. Soc. Beng. 1873. 74.

HAB. Tenasserim, Tavoy (Wall. Cat. 6247. E).—Fr. Nov.

4. *P. LANUGINOSA*, Wall. Pl. As. rar. II. 52. t. 165; Miq. Fl. Ind. Bat. II. 259. (*P. macrocarpa*, Wall. Cat. 7292; Don Gen. Syst. IV. 561).

HAB. Frequent in the mixed forests, especially along chougns, all over Burma from Ava and Martaban down to Tenasserim; also freely springing up in the upper toungyas.—Fl. Jan.—July; Fr. Jan.—March.

### *Lasianthus*, Jack.

#### *Conspectus of Species.*

\* Flowers in clusters or short peduncled cymes, the bracts very minute and usually deciduous.

Flowers sessile; calyx glabrous, the lobes about as long as the tube; drupes crowded by the linear-lanceolate calyx-teeth, ..... *L. lucidus*.

Flowers very shortly pedicelled or almost sessile; calyx puberulous, the limb broad with very short teeth; drupes crowned with the cyathiform contracted almost truncate calyx-limb; ..... *L. constrictus*.

\* \* Flowers in densely bracted sessile clusters, the bracts more or less conspicuous and often persistent.

× Calyx-segments about a line long or shorter. Stipules small.

Leaves shortly petioled, puberulous beneath; outer bracts broad and blunt, but short; calyx-lobes lanceolate, ..... *L. stercorarius*.

Sparingly stiff-hairy; leaves almost sessile, oblique; bracts all linear-subulate, hirsute, ..... *L. Wallichii*.

× × Calyx-segments linear to linear-subulate, 3—5 lin. long, hirsute.

+ Stipules very large and leafy, oval.

Leaves glabrous or nearly so; stipules persistent, involucreting the flower heads,

.. *L. stipularis*.

+ + Stipules more or less lanceolate, small, not leafy.

All parts brown-hirsute; outer bracts very large, leafy, ovate, acuminate, *L. cyanocarpa*.

1. *L. LUCIDUS*, Bl. Bydr. 997; Miq. Fl. Ind. Bat. II. 319.

HAB. Upper Tenasserim (Falconer).—Fl. Febr.

2. *L. CONSTRICTUS*, Wight in Maclell. Calc. Journ. VI. 515; Walp. Ann. II. 762. (*L. pauciflora*, Wight l. c. ?; *Mephitidea* sp. Griff. Not. Dicot. 267. t. 474. f. 4).

HAB. Common in the tropical forests of the Andamans; Tenasserim, from Thoungyeen (Brandis) to Mergui (Griff.).—Fl. Fr. April—June.

Habit of *L. stercorarius*, but differs in the inflorescence and in the shape of the calyx-limb.

3. *L. STERCORARIUS*, Bl. Bydr. 1000; Miq. Fl. Ind. Bat. II. 324 and Annal. Mus. Lugd. Bat. IV. 248.

HAB. Frequent in the tropical forests of Upper Tenasserim and the Andamans.—Fl. March, April.

4. *L. WALLICHII*, Wight in Maclell. Calc. Journ. VI. 503. (*Mephitidea Wallichii*, WA. Prod. I. 390; Walp. Ann. II. 760; *Nonatelia*? *hispida*, Wall. in Roxb. Fl. Ind. II. 187).

HAB. Not unfrequent in the tropical forests of Martaban and Upper Tenasserim; also on the Andamans.—Fl. April, May; Fr. March.

5. *L. STIPULARIS*, Bl. Bydr. 997; Miq. Fl. Ind. Bat. II. 319 and Ann. Mus. Lugd. Bat. IV. 246.

HAB. Tenasserim (or Andamans) (Helf. 2937).

6. *L. CYANOCARPUS*, Jack in Linn. Trans. XIV. 125; Miq. Fl. Ind. Bat. II. 316, non Bl.—(*L. bracteatus*, Wight in Maclell. Calc. Journ. VI. 501; *Triosteum hirsutum*, Roxb. Fl. Ind. ed. Wall. II. 180; *L. Roxburghii*, Wight l. c. 502).

HAB. Chittagong (Roxb.); rather frequent in the tropical forests of South Andaman.—Fl. May, June.

### **Cephaelis, L.**

1. *C. HERBACEA*, Roxb. Fl. Ind. I. 533. (*Psychotria herbacea*, L. sp. pl. 245; *Geophila reniformis*, Don. Prod. Nep. 136; Wight Icon. t. 54; Miq. Fl. Ind. Bat. II. 311).

HAB. Rather frequent in tropical forests, especially in the shade of bamboo, from Martaban and the southern spurs of the Pegu Yomah down to Tenasserim and the Andamans.—Fl. June, July; F. Oct.—Dec.

### **Hydnophytum, Jack.**

1. *H. FORMICARUM*, Jack in Linn. Trans. XIV. 124; Miq. Fl. Ind. Bat. II. 309.

HAB. Frequent on trees in the mangrove swamps of the Andamans.  
—Fl. Fr. May, June.

### Psychotria, L.

#### Conspectus of Species.

*Subg. 1. Leucopyrenos.* Seeds plano-convex without ribs or dorsal keel, enclosed in a white thin membranous pyrene.

Small decumbent under-shrub, the stems and often also the nerves beneath shortly tomentose, ..... *P. calocarpa*.

*Subg. 2. Eu-Psychotria.* Pyrenes hard, with a more or less distinct dorsal rib, or ribbed and furrowed.

\* *Pyrenes not ribbed and furrowed, but dorsally more or less distinctly keeled or trigonous.*

× *Pyrenes* plano-convex, with an obsolete longitudinal dorsal rib. Albumen spuriously ruminato.

Glabrous; panicles elongate and raceme-like, ..... *P. connata*.  
As preceding; leaves larger; panicle thyrsoid or corymb-like; berries obovoid,

.. *P. platyneura*.

× × *Pyrenes* 3-gonous, the inner face flat, the 2 lateral ones more or less concave and meeting in a longitudinal ridge.

+ Quite glabrous.

Habit of *P. connata*; cymes small, in slightly puberulous peduncled panicles; calyx about a lin. across; obsoletely 5-toothed; albumen equable, .... *P. symplocifolia*.

+ + Tawny or rusty hairy. Flowers sessile, clustered or in heads.

Flower-heads very small; leaves glabrous above, ..... *P. polymeura*.

Flower-heads rather large, compact; leaves hirsute on both sides; albumen equable,

.. *P. Helferiana*.

\* \* *Pyrenes longitudinally ribbed and furrowed (ribs usually 3—5.)*

× Flowers clustered or in heads.

Leaves opaque; cyme compact, somewhat tomentose; bracts subulate; albumen ruminato, ..... *P. monticola*.

Leaves glossy; panicle thyrsoid, glabrous, the branchings whorled; bracts broadly ovate, ..... *P. adenophylla*.

× × Flowers pedicelled, in lax cymes or corymbs.

+ Small erect shrubs.

× Leaves thick membranous or pergamentaceous, turning more or less brownish in drying.

† Drupo 4—5 lin. long.

Glabrous; cymes rusty-puberulous; albumen ruminato, ..... *P. viridiflora*.

† † Drupo only 2—3 lin. long. Albumen ruminato.

Cymes rusty puberulous on a peduncle 1— $\frac{1}{2}$  in. long; calyx-teeth distinct, linear; berries crowned by the calyx-lobes, ..... *P. Asiatica*.

Cymes rusty puberulous, almost sessile; calyx almost truncate; berries truncate-crowned, ..... *P. Andamanica*.

Cymes glabrous; leaves narrower, ..... *P. divergens*.

× × Leaves thin membranous, remaining green in drying.

All parts glabrous, ..... *P. viridissima*.

+ + Large scandent shrubs. Albumen equable.

Corymbs furnished at the lower branchings with 2 opposite narrow floral leaves,  
 .. *P. sarmentosa*.

1. *P. CALOCARPA*, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Frequent in the tropical forests of Pegu and Martaban down to Upper Tenasserim; Ava, Kakhien hills (J. Anderson).—Fl. Aug.—Febr. Fr. Jan.—March.

2. *P. CONNATA*, Wall. in Roxb. Fl. Ind. II. 163; WA. Prod. I. 433. (*Grumilea elongata*, Wight Icon. t. 1036; *Pæderia erecta*, Roxb. Fl. Ind. I. 685).

HAB. Frequent in the moister upper mixed and in the tropical forests of the Pegu Yomah and Tenasserim down to the Andamans.—Fl. April, May; Fr. CS.

3. *P. PLATYNEURA*, Kurz in Trim. Journ. Bot. 1875. 327.

HAB. Frequent in the tropical forests of the Andaman islands.—Fl. May, June.

Much resembling *P. robusta*, Bl., from which it differs in the stipules, glabrous inflorescence, and glabrous corolla.

4. *P. SYMLOCIFOLIA*, Kurz For. Fl. II. 11.

HAB. In the drier hill-forests of the Martaban hills east of Tounghoo, not rare at 5000 to 7000 ft. elevation.—Fl. Fr. March.

• 5. *P. POLYNEURA*, Kurz in Trim. Journ. Bot. 1875. 327.

HAB. Not unfrequent in the tropical forests of the South Andaman.—Fl. May.

6. *P. HELFERIANA*, Kurz in Journ. As. Soc. Beng. 1872. 314.

HAB. Tenasserim—or Andamans?—(Helf. 3038).

7. *P. MONTICOLA*, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Frequent in the moister hill-forests of Martaban and Upper Tenasserim, at 3500 to 6000 ft. elevation.—Fl. Fr. March, April.

8. *P. ADEXOPHYLLA*, Wall. in Roxb. Fl. Ind. II. 166.

HAB. Tenasserim—or Andamans?—(Helf. 3037).

Wallich describes his plant as having racemes of the thickness of the little finger; my plant agrees with his herbarium-specimens and belongs in the vicinity of *Grumilea Gardneri*, Thw., a very near ally to *Psych. leucocoma*, Teysm. and Binn. in Tydsch. Nat. Ver. Ned. Ind.

9. *P. VIRIDIFLOBA*, Reinw. ap. Bl. Bydr. 963; DC. Prod. IV. 521; Miq. Ann. Mus. Lugd. Bat. IV. 207. (*Grumilea viridiflora*, Miq. Fl. Ind. Bat. II. 298).

Var. *α*. *GENUINA*, stipules broad and rather large; leaves entire; cymes puberulous; calyx-teeth inconspicuous.

Var. *β*. *UNDULATA*, as preceding, but leaves undulate, the calyx-teeth about  $\frac{1}{2}$  lin. long.

? Var.  $\gamma$ . *CALOPHYLLA*, (*P. calophylla*, Wall. and Griff. MS.), stipules small and subulate; cymes glabrous; calyx-teeth about  $\frac{1}{4}$  lin. long.

HAB. Var.  $\beta$ . Chittagong (Hf. and Th.).

*P. picta*, Wall. Cat. 8353. B. from Tavoy, Tenasserim, seems to belong to var.  $\gamma$ ., but the specimens are too imperfect for identification.

10. *P. ANDAMANICA*, Kurz in Trim. Journ. Bot. 1875. 328.

HAB. Frequent in the tropical forests of the Andamans.—Fl. Fr. April, May.

11. *P. DIVERGENS*, Bl. Bydr. 959; DC. Prod. IV. 320; Miq. Ann. Mus. Lugd. Bat. IV. 206. (*Grumilea divergens*, Miq. Fl. Ind. Bat. II. 299).

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim, very rare in those of the eastern slopes of the Pegu Yomah.—Fl. May—June; Fr. Febr., March.

This may possibly be a form only of *P. Asiatica*.

12. *P. VIRIDISSIMA*, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Rather rare in the tropical forests of Martaban east of Tounghoo and in Tenasserim (Helf. 3048).

13. *P. SARMENTOSA*, Bl. Bydr. 964; DC. Prod. IV. 522; Miq. Fl. Ind. Bat. II. 286 and Ann. Mus. Lugd. Bat. IV. 206; Wight Icon. t. 1038.

HAB. • Tenasserim, Amherst (Falconer).—Fl. April.

#### *Chasalia*, Comm.

1. *CH. CURVIFLORA*, Thw. Ceyl. Pl. 150; Miq. Ann. Mus. Lugd. Bat. IV. 202.—(*Psychotria curviflora*, Wall. in Roxb. Fl. Ind. II. 167; *Psychotria ophioxyloides*, Wall. l. c. 168; *Ch. lurida*, Miq. Fl. Ind. Bat. II. 282?; *Psychotria ambigua*, WA.; Wight Illustr. II. t. 127).

HAB. Not unfrequent in the tropical forests from Martaban down to Tenasserim and the Andamans.—Fl. April, May.

#### *Saprosma*, Bl.

##### *Conspectus of Species.*

*Flowers sessile, terminal.*

Flowers solitary; stipules cut and fringed, ..... *S. consimile*.

\* \* *Flowers solitary or by 3 or more in peduncled, axillary cymes.*

Cymes poor-flowered, long-peduncled, glabrous, axillary by 2—4; upper leaves usually ternary; corolla 4-merous, ..... *S. ternatum*.

1. *S. CONSIMILE*, Kurz For. Fl. Burm. II. 29.

HAB. Not unfrequent in the drier hill-forests, at 3000 to 5000 ft. elevation; from the Martaban hills to Tenasserim.—Fr. Febr.

\* Much resembles *S. fruticosum*, Bl., but differs in the flowers and stipules.

2. S. TERNATUM, Bth. and Hf. Gen. Pl. II. 131, (*Serissa ternata*, Kurz in And. Rep. ed. 2. 40; *Pæderia ternata*, Wall. Cat. 6248; Don Gen. Syst. III. 561).

Var.  $\alpha$ . GENUINA, all parts quite glabrous.

? Var.  $\beta$ . PUBERULA, stipules, petioles, and nerves beneath more or less pubescent.

HAB. Var.  $\beta$ . rather frequent in the tropical forests of the Andamans—Fl. May, June.

### Coffea, L.

#### Conspectus of Species.

\* Corolla funnel-shaped.

All parts quite glabrous and glossy; flowers very shortly pedicelled, in axillary clusters, ..... *C. Arabica*.

\* \* Corolla salver-shaped.

× Berries peduncled.

All parts quite glabrous and glossy; flowers on pedicels,  $\frac{1}{2}$ —1 in. long usually terminal, rarely axillary, ..... *C. tetrandra*.

× × Berries sessile.

Young shoots and nerves beneath sparingly pubescent; flowers sessile, terminal and axillary, ..... *C. Benghalensis*.

\*1. *C. ARABICA*, L. sp. pl. 245; Roxb. Fl. Ind. ed. Wall. II. 193; Sims. Bot. Mag. t. 1303; Wight Icon. t. 53; Miq. Fl. Ind. Bat. II. 305.

HAB. Occasionally cultivated, but nowhere on a large scale.—Fl. March—May; Fr. Nov.—Jan.

2. *C. TETRANDRA*, Roxb. Fl. Ind. ed. Wall. II. 193; DC. Prod. IV. 499. (*Prismatomeris tetrandra*, Hf. in Bth. and Hf. Gen. pl. II. 119).

HAB. Not unfrequent in the tropical forests of the Martaban hills and the Andamans, up to 3000 ft. elevation; also Chittagong.—Fl. March, April.

3. *C. BENGALENSIS*, Roxb. Fl. Ind. ed. Wall. II. 194; DC. Prod. IV. 499; WA. Prod. I. 435; Bot. Mag. t. 4917.

HAB. Tropical forests of Martaban and Tenasserim; also Chittagong.

### Ixora, L.

#### Conspectus of Species.

Subg. 1. *Pavetta*, L. Flowers 4- or 5-merous. Style exerted to the same or nearly the same length of the tube, the stigma simple and spindle-like.

O Corolla more funnel-shaped, the tube only 3 lin. long.

+ Flowers sessile or nearly so, in a dense head.

Glabrous, turning black in drying; habit of *I. Pavetta*. ..... *I. compactiflora*.

+ + Flowers in cymes or corymbs, shortly pedicelled.

Glabrous, the corymbs puberulous and recurved; berries crowned by the calyx-lobes,  
 .. *I. recurva*.

Glabrous, also the erect or nearly erect corymbs; berries marked by the circular scar  
 of the fallen calyx-limb, ..... *I. weberæfolia*.

O O Corolla-tube slender,  $\frac{1}{2}$ — $\frac{3}{4}$  in. long; flowers pedicelled.

All parts (also the corymbs) glabrous, in drying remaining green, ..... *I. Pavetta*.

All parts more or less puberulous to tomentose, usually turning black in drying;  
 corymbs short-puberulous, ..... *I. tomentosa*.

All parts villous-pubescent, in drying not blackening; corymbs villous from spreading  
 short hairs, ..... *I. naucleiflora*.

*Subg. 2. Ixora.* L. Flowers 4- rarely 5-merous. Style shorter or  
 longer exerted but never exceeding the corolla-tube by more than  $\frac{1}{2}$ — $\frac{3}{4}$  of  
 its length, the stigmatic lobes usually spreading, rarely longer cohering.

§. *Eu-Ixora.* Flowers 4-merous.

\* *Flowers in sessile or peduncled cymes or corymbs.*

× Corymbs trichotomous, short-peduncled or sessile and in this case con-  
 sisting of 3 or more terminal peduncled cymes. Flowers and fruits  
 conspicuously (1—2 lin.) pedicelled as in true *Pavetta*.

+ Leaves acuminate or acute at the base, on a petiole  $\frac{1}{2}$ —1 in. long.

Leaves one-coloured, black in drying; flowers white; corolla-tube 4 lin. only long,  
 .. *I. coriacea*.

Exactly as preceding, but corolla-tube nearly an inch long, ..... *I. macrosiphon*.

Leaves pale-coloured beneath; flowers pale-rose; corolla-tube an inch long, *I. rosella*.

+ + Leaves sessile or nearly so, the base rounded or cordate.

Tree; corymbs on a peduncle 1—1 $\frac{1}{2}$  in. long, ..... *I. brunnescent*.

× × Cymes or corymbs short-peduncled or sessile, the flowers sessile or  
 shortly and stoutly pedicelled.

+ Flowers white or rarely pale rose-coloured (never orange or scar-  
 let), the corolla-lobes often comparatively narrower.

O Corolla puberulous or pubescent outside.

All parts more or less pubescent; cyme rather small, almost sessile; leaves pubescent,  
 sessile, ..... *I. Brunonis*.

O O Corolla glabrous, rarely the throat bearded.

† Flowers sessile. Corolla-tube  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, the throat  
 naked.

Shrub; leaves sessile with a rounded or cordate base; corymb glabrous,  
 .. *I. memecylifolia*.

Shrub; leaves petioled, the base acute or obtuse; corymb glabrous, .... *I. sessiliflora*.

Tree; leaves petioled, the base acute or obtuse; cymes puberulous, ..... *I. rugosula*.

† † Flowers shortly pedicelled. Corolla-tube 1 $\frac{1}{2}$ —2 in.  
 long, the throat bearded.

Glabrous, also the inflorescence; cyme sessile or nearly so, ..... *I. Brandisiana*.

• + + Flowers orange to deep scarlet, very rarely (in varieties,  
 chiefly) white or pale rose-coloured, and in this case the corolla-  
 lobes always much broader than those of the white-flowered sec-  
 tion.

O Calyx-teeth very short.

† Inflorescence puberulous.

Glabrous; calyx-teeth acute; corolla-lobes more or less acute, ..... *I. coccinea*.

† † Inflorescence glabrous.

Glabrous; calyx-teeth blunt; corolla-tube 1—1½ in. long, the lobes almost orbicular,  
.. *I. stricta*.

Glabrous; 2 of the calyx-teeth acute, the 2 others blunt; corolla-lobes acute or almost acuminate, ..... *I. glauca*.

O O Calyx-teeth 1—1½ lin. long.

Glabrous; calyx-lobes erect; flowers white, ..... *I. Korthalsiana*.

\* \* *Corymbs* panicled, the panicles thyrsoid, brachiate-trichotomous, longer or shorter peduncled.

× Panicle thyrsoid, long-peduncled, furnished at the base or above the base of the peduncle with a pair of sessile cordate or oval floral leaves.

† Corolla-throat naked, the tube 5—6 lin. long.

Leaves thin, turning black in drying; panicle glabrous; pedicels 1—2 lin. long,

.. *I. nigricans*.

Leaves membranous or chartaceous, one-coloured; pedicels 1—2 lin. long; panicle glabrous, ..... *I. diversifolia*.

Leaves coriaceous, pale-coloured beneath; flowers sessile; panicle puberulous,  
.. *I. spectabilis*.

+ + Corolla-throat bearded.

Glabrous; corolla-tube an inch long, ..... *I. barbata*.

× × Panicle longer or shorter peduncled, without floral leaves.

+ Style hairy. Panicle minutely puberulous.

Tree; all parts glabrous; flowers sessile, the corolla-tube only 2—2½ lin. long,

.. *I. parviflora*.

+ + Style glabrous. Panicle pubescent.

Shrub; leaves puberulous beneath; corolla-tube 1—1½ in. long, ..... *I. villosa*.

Shrub; leaves and branchlets glabrous; corolla-tube ½ in. long, ..... *I. cuneifolia*.

§ § *Pentadium*, DC. Flowers 5-merous. Panicle long-peduncled.

Leaves glabrous, membranous, ..... *I. Helferi*.

Leaves almost coriaceous, more or less shortly pubescent beneath, ..... *I. longifolia*.

1. *I. COMPACTIFLORA*, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Upper Tenasserim, Daunat-pass on the Thounggyeen side, at 2000 ft. elevation (Dr. Brandis).—Fl. April.

Allied to *Ixora* (*Pavetta*) *involucrata*, Thw., from Ceylon.

2. *I. RECURVA*, (*Pæderia recurva*, Roxb. Fl. Ind. ed. Wall. II. 518; DC. Prod. IV. 471).

HAB. Chittagong, in moist situations amongst the hills (Roxb.).—Fl. HS.; Fr. Oct., Nov.

3. *I. WEBERÆFOLIA*, (*Pavetta weberæfolia*, Wall. Cat. 6182; Don Gen. Syst. III. 575; *Pavetta cerberæfolia*, Miq. Fl. Ind. Bat. II. 279).

HAB. Common in the coast-forests of the Andamans; Ava, Segain (Wall. Cat. 7290).—Fl. Fr. ∞.

Very near to the preceding species, and some of Wallich's specimens indeed really seem to be referable to Roxburgh's *Pæderia recurva*.

4. *I. PAVETTA*, Roxb. Fl. Ind. ed. Wall. I. 395; Bth. Fl. Austr.

III. 414. (*Pavetta Indica*, L. sp. pl. 160; WA. Prod. I. 431; Wight Icon. t. 148).

HAB. Not unfrequent in the coast-forests of the Andamans.—Fl. May, June.

5. I. *TOMENTOSA*, Roxb. Fl. Ind. ed. Wall. I. 296; Bth. Fl. Austr. III. 414. (*Pavetta tomentosa*, Sm. in Rees Cycl.; WA. Prod. I. 431; Wight Icon. t. 186; *Pavetta subvelutina*, Miq. Fl. Ind. Bat. II. 276; *Pavetta Indica*, Miq. l. c. 275, an Linné?; *Pavetta Rothiana*, DC. Prod. IV. 491; Miq. in Ann. Mus. Lugd. Bat. IV. 195; *Pavetta montana*, Rwdt. in Bl. Bydr. 952; Miq. Ann. Mus. Lugd. Bat. IV. 195).

Var. *α*. *ROXBURGHII*, leaves, &c., more or less pubescent, especially beneath.

Var. *β*. *GLABRESCENS*, leaves of a thinner texture, only sparingly and minutely puberulous, especially beneath, or quite glabrescent.

HAB. Common in all leaf-shedding forests, all over Burma, from Ava and Martaban down to Tenasserim; var. *α*. more on permeable substrata and on alluvium.—Fl. June, July; Fr. CS.

N. B. *Pavetta Brunonis*, Wall. ap. Wight Icon. t. 1065, seems to be that tomentose harsh-leaved form of the above species which is also frequent on calcareous substrata in Ava. Miquel, in his Fl. Ind. Bat., confounds *Pavetta Brunonis*, Wall. Cat. 6172, and *Ixora Brunonis*, Wall. Cat. 6163, two perfectly different species.

6. I. *NAUCLEIFLORA*, (*Pavetta naucleiflora*, Wall. Cat. 6171; Don. Gen. Syst. III. 575; Miq. Fl. Ind. Bat. II. 278).

HAB. Tenasserim, Moulmein hills (Falconer).—Fl. Febr.

7. I. *MACROSIPHON*, Kurz in Trim. Journ. Bot. 1875. 327.

HAB. Not unfrequent in the tropical and beach-forests of the Andaman islands.—Fl. May.

8. I. *ROSELIA*, Kurz in Journ. As. Soc. Beng. 1872. 317.

HAB. Frequent in the tropical forests of the Andaman islands.—Fl. May, June.

9. I. *BRUNNESCENS*, Kurz in Journ. As. Soc. Beng. 1872. 317.

HAB. Frequent in the coast, more especially the beach-forests of the Andaman islands.—Fr. April.

10. I. *BRUNONIS*, Wall. Cat. 6136; Don. Gen. Syst. III. 375.

HAB. Locally in the tropical forests of the eastern slopes of the Pegu Yomah, especially on the head-waters of the Khaboung stream.—Fl. April, May.

11. I. *MEMECYLIFOLIA*, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Upper Tenasserim, Houndrow (Dr. Brandis).—Fl. April.

The inflorescence and flowers are suspiciously like those of *I. sessilis* flora, Kz., and, despite the very different looking leaves, may only be a variety of it.

12. *I. SESSILIFLORA*, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Not unfrequent in the drier hill-forests of Martaban east of Tounghoo, at 3000 to 4000 ft. elevation.—Fl. April.

Very near to *I. subsessilis*, Wall., but differs in the sessile flowers, calyx, &c.

13. *I. RUGOSULA*, Wall. Cat. 6158; Kurz For. Fl. Burm. II. 25.

HAB. Rare along choungs in the tropical forests of the central parts of the Pegu Yomah; Upper Tenasserim, hot springs of the Attaran river (Wall.).—Fl. May; Fr. Febr.

14. *I. BRANDISIANA*, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Upper Tenasserim, Attaran (Dr. Brandis).—Fl. July.

\*15. *I. COCCINEA*, L. sp. pl. 159; Roxb. Fl. Ind. ed. Wall. I. 385; WA. Prod. I. 427; Wight Icon. t. 153; Miq. Fl. Ind. Bat. II. 266. (*I. grandiflora*, R. Br. in Bot. Reg. t. 152; *I. propinqua*, R. Br. in Wall. Cat. 6119; Don. Gen. Syst. III. 570).

Var. *α. LINNEANA*, corolla-lobes ovate-lanceolate, very acute.

Var. *β. BANDHUCA*, (*I. Bandhuca*, Roxb. Fl. Ind. ed. Wall. I. 386; Bot. Reg. t. 513; Wight Icon. t. 149; Miq. Fl. Ind. Bat. II. 266), corolla-lobes broadly ovate, bluntish; leaves usually all sessile, with a cordate base, blunt, mucronate.

HAB. Generally planted all over the country, but nowhere wild.—Fl. March.

16. *I. STRICTA*, Roxb. Fl. Ind. I. 384; DC. Prod. IV. 486; Wight Icon. t. 1307.—(*Pavetta stricta*, Miq. Fl. Ind. Bat. II. 269; *I. coccinea*, Curt. Bot. Mag. t. 169; *I. alba*, Roxb. Fl. Ind. ed. Wall. I. 389; Wight Icon. t. 707; *I. blanda*, Ker. Bot. Reg. t. 100).

Var. *α. ROXBURGHIANA*, corymbs sessile or nearly so, rarely shortly peduncled; leaves usually almost sessile and often rounded at the base.

Var. *β. BLUMEANA*, (*Pavetta Javanica*, Bl. Bydr. 949; Miq. Fl. Ind. Bat. II. 268 and Ann. Mus. Lugd. Bat. IV. 191; *I. amara*, Wall. Cat. 6121; Miq. Fl. Ind. Bat. II. 267), corymbs more lax, on a 1—1½ in. long peduncle; leaves usually acute at the base; petiole 1—2 lin. long; flowers somewhat larger.

HAB. Both varieties in Upper Tenasserim, Moulmein, also in tropical forests above Rangoon in Pegu.—Fl. Jan.—April.

17. *I. GLAUCINA*, (*Pavetta glaucina*, Teysm. and Binn. in Nat. Tydsch. Ned. Ind. XXIX. 245).

HAB. Upper Tenasserim, Attaran (Falconer, Brandis).—Fl. Febr.

This differs from *I. fulgens*, Roxb., chiefly in the corolla-lobes; these are figured in Roxburgh's drawings as very acute, while Wallich's specimens of this name have them blunt. The leaves are now rather opaque, now very glossy above, and they seem to vary in shape also. *Pavetta*

*Lobbia*, Teysm. and Binn. (Griff. 2985), is also very near to it, but really distinct in my eyes. *Pavetta Teysmanniana*, Miq., and *Pavetta macrophylla*, Teysm. and Binn., are both the same and probably not specifically different from *Ixora congesta*, Roxb. *Ixora alba* of the Botanical Garden at Buitenzorg (not of Roxb.) appears to me to be the same as Korthals' *Pavetta calycina*, and has exactly the calyx of *I. calycina*, Thw., but otherwise the two species are entirely different. In order to avoid confusion, I suggest that the Malayan species should be called *Ixora Korthalsiana*. *Ixora jucunda*, Thw., and *Pavetta Wyckii*, Hassk., appear to me conspecific.

18. *I. NIGRICANS*, R. Br. in Wall. Cat. 6154; WA. Prod. I. 428; Wight Icon. t. 318. (*Pavetta nigricans*, Miq. Fl. Ind. Bat. II. 272; *I. affinis*, Wall. Cat. 6144).

Var. *α*. GENUINA, corolla-lobes acute.

Var. *β*. ERUBESCENS, (*I. erubescens*, Wall. Cat. 6143; Miq. Fl. Ind. Bat. II. 270), corolla-lobes blunt.

HAB. Var. *β*. frequent in the swamp-forests and along swampy borders of lakes, &c., from Pegu and Martaban down to Tenasserim.—Fl. March—May.

I do not think that varieties *α*. and *β*. can be retained as distinct species; both forms occur as well in Malaya as in Hindustan.

19. *I. DIVERSIFOLIA*, Wall. Cat. 6146; Kurz For. Fl. Burm. II. 22.

HAB. Not unfrequent in the tropical forests, especially in marshy places and on muddy banks, from Martaban down to Tenasserim.—Fl. Febr.; Fr. April, May.

Allied to *I. paludosa* (*Pavetta paludosa*, Bl. Bydr. 954; Miq. Fl. Ind. Bat. II. 271 and Ann. Mus. Lugd. Bat. IV. 198).

20. *I. SPECTABILIS*, Wall. Cat. 6133; Don. Gen. Syst. III. 572; Walp. Rep. II. 482.

HAB. Frequent along choungs in the tropical forests of Arracan and from Martaban down to Tenasserim.—Fl. May, June; Fr. Oct.—March.

I have not seen Wallich's specimens and identify my tree from Don's description alone.

21. *I. BARBATA*, Roxb. Fl. Ind. ed. Wall. I. 394; DC. Prod. IV. 487; Bot. Mag. t. 2505 and t. 4513; Wight Icon. t. 185.

HAB. Rather frequent in the tropical forests of the Andamans.—Fl. May, June.

22. *I. PARVIFLORA*, Vhl. Symb. III. 2. t. 52; Roxb. Fl. Ind. ed. Wall. I. 393; WA. Prod. I. 429; Hook. Bot. Misc. III. 292. suppl. t. 34; Wight Icon. t. 711; Bedd. Fl. Sylv. t. 222. (*I. decipiens*, Griff. Not. Dicot. 271?; *I. Pavetta*, Andr. Bot. Rep. I t. 78).

HAB. Not unfrequent in the dry and mixed forests of the Prome District.—Fl. March.

23. *I. VILLOSA*, Roxb. Fl. Ind. ed. Wall. I. 392; DC. Prod. IV. 488; Wight Icon. t. 150.

HAB. Rare in the tropical forests of the eastern slopes of the Pegu Yomah (head-waters of the Khaboung stream).—Fl. May.

24. *I. CUNEIFOLIA*, Roxb. Fl. Ind. ed. Wall. I. 390; WA. Prod. I. 428; Bot. Reg. t. 648; Bot. Cab. t. 1215; Wight Icon. t. 1312.—(*I. oblonga*, Wall. Cat. 6147?; *Pavetta Ackeringae* Teysm. and Binn. in Natuurk. Tydsch. Ned. Ind. XXVII. 31).

Var. *α*. ROXBURGHII, panicle sessile or short-peduncled; leaves glabrous

Var. *β*. PUBERULA (*Ix. puberula*, Wall. Cat. 6145), panicle usually longer peduncled; leaves minutely puberulous beneath.

Var. *γ*. PUMILA, only 1—3 ft. high, simple or nearly so; flowers often pale rose-coloured; corymbs small and short, more slender; leaves glabrous.

HAB. Frequent (var. *α*. and *β*.) in the tropical forests along the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim; var. *γ*. Martaban, in the eng-forests.—Fl. Febr.—April.

A very variable plant, of which some forms closely approach *I. villosa*. I identify Roxburgh's species from the Wallichian specimens thus named, which have pubescent inflorescences, while Roxburgh's drawings exhibit sessile glabrous corymbs. Var. *γ*. may form a distinct species, but (being a laterite plant) it shews no other differences except such reductions and modifications of growth as can be explained by the influence of the peculiar substratum on which it grows.

25. *I. HELFERI*, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Tenasserim (Helf. 3008).

The specimens before me are incomplete but very much resemble the following species.

26. *I. LONGIFOLIA*, Don Gen. Syst. III. 573; Walp. Rep. II. 482 (*I. macrophylla*, R. Br. in Wall. Cat. 6165, non Bl. nec alior.).

HAB. Martaban, are in the tropical forests of Toukyeghat east of Tounghoo, Fl. May or June.

### **Gynochthodes, Bl.**

1. *G. MACROPHYLLA*, Kurz in Journ. As. Soc. Beng. 1872, 314, and in Trim. Journ. Bot.

HAB. Along the coasts of the Andamans.—Fl. May.

### **Morinda, L.**

#### *Conspectus of Species.*

Subg. 1. *Morinda*, L. Corolla-limb 5- rarely 6-lobed. Stamens as many. Erect shrubs or trees.

\* *Stamens exserted.*

All parts glabrous; flower-heads on short, leaf-opposed peduncles, ..... *M. exserta*.

\* \* Stamens included in the corolla-tube. \*

× All parts more or less tomentose or pubescent.

All parts shortly and roughish pubescent; corolla glabrous, ..... *M. leiantha*.

All parts (also the corolla) softly and shortly tomentose, ..... *M. tomentosa*.

× × All parts (also the corolla) glabrous.

+ Flower-heads solitary and leaf-opposed.

† Flower-heads longer or shorter peduncled.

Stipules rounded or blunt; corolla-throat hairy; berries united into a fleshy greenish white syncarp, ..... *M. citrifolia*.

Stipules acute or acuminate; corolla-tube naked; berries purplish black, only few developed on the thick torus, ..... *M. angustifolia*.

† † Flower-heads sessile or nearly so.

Low shrub; quite glabrous or minutely scabrous, ..... *M. persicaefolia*.

† † Flower-heads in a peduncled terminal cyme.

Quite glabrous; corolla-tube only  $\frac{1}{4}$  in. long, the lobes as long, ..... *M. Wallichii*.

Subg. 2. *Lucinaca*, DC. Corolla-limb 4-parted. Stamens 4. Scandent shrubs.

\* *Calyx truncate*.

Flower-heads peduncled, in terminal umbels; peduncles sparingly pubescent, the other parts glabrous; leaves pale-coloured and opaque beneath, the nerves not prominent, ..... *M. umbellata*.

As preceding, but leaves glossy on both sides, the net-venation prominent, *M. tetrandra*.

\* \* *Calyx 4-toothed*. All parts glabrous.

Calyx sulcate; flower-heads by threes in a peduncled poor brachiate terminal cyme,

.. *M. speciosa*.

1. *M. LEIANTHA*, Kurz in Journ. As. Soc. Beng. 1872. 313.

HAB. Tenasserim, Moulmein District (Falconer).—Fl. Febr.

2. *M. TOMENTOSA*, Heyne in Roth Nov. sp. 147; DC. Prod. IV. 448; WA. Prod. I. 420. (*M. multiflora*, Roxb. Fl. Ind. ed. Wall. II. 200).

HAB. Not unfrequent in the mixed dry forests of the hills in Prome District.—Fl. March.

3. *M. CITRIFOLIA*, L. sp. pl. 250; DC. Prod. IV. 446.; Roxb. Fl. Ind. I. 541; Miq. Fl. Ind. Bat. II. 242; Bedd. Fl. Sylv. t. 220.

Var. *a. GENUINA*, stipules blunt; syncarps the size of a hen's egg, or somewhat larger.

Var. *β. BRACTEATA*, (*M. bracteata*, Roxb. Fl. Ind. ed. Wall. II. 189; Wight Ill. t. 126), stipules often acute; syncarps much smaller.

HAB. Var. *a.* only planted all over Pegu and Martaban, and elsewhere; var. *β.* not unfrequent in the tropical forests of the Andamans.—Fl. April, May.

4. *M. ANGUSTIFOLIA*, Roxb. Fl. Ind. ed. Wall. II. 201 and Corom. Pl. III. t. 237; DC. Prod. IV. 447, non Roth.

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim; Ava, Khatkyen hills; frequently cultivated all over the country.—Fl. March, April.

5. *M. PERSICÆFOLIA*, Ham. in Trans. Linn. Soc. XIII. 535 ; DC. Prod. IV. 447.

Var. *α. GENUINA*, all parts quite glabrous.

Var. *β. SCABRA*, all softer parts more or less rough from a minute indistinct pubescence.

HAB. Common in the savannahs from Ava and Martaban down to Upper Tenasserim ; var. *β.* in the dry forests of the Prome District.—Fl. March—May ; Fr. June.

6. *M. WALLICHII*, Kurz in Journ. As. Soc. Beng. 1872. 313.

HAB. Tenasserim (Revd. Parish, 316).

7. *M. TETRANDRA*, Jack Mal. Misc. II. 13 ; Roxb. Fl. Ind. ed. Wall. II. 201 ; Miq. Fl. Ind. Bat. II. 246.

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim.

8. *M. SPECIOSA*, Wall. Cat. 8436 ; Kurz For. Fl. Burm. II. 62. (*Rennellia speciosa*, Bth. and Hf. Gen. pl. II. 118).

HAB. Upper Tenasserim, Chappedong hills (Wall.).

### **Vangueria**, Comm.

#### *Conspectus of Species.*

+ Unarmed.

All parts glabrous ; stigma mitre-shaped, ..... *V. edulis*.

× × Armed with opposite sharp spines.

All parts glabrous ; berries about an inch thick, ..... *V. spinosa*.

All softer parts (also the corolla) pubescent ; berries up to  $\frac{1}{2}$  inch thick, .... *V. pubescens*.

\*1. *V. EDULIS*, Vhl. Symb. III. 36 ; WA. Prod. I. 421 ; Miq. Fl. Ind Bat. II. 249.—(*V. Commersonii*, Desf. in Jacq. Hort. Schoenb. I. t. 44).

HAB. Chittagong, planted in gardens (Wall.).

2. *V. SPINOSA*, Roxb. Fl. Ind. ed. Wall. II. 172 ; DC. Prod. IV. 454.

HAB. Not unfrequent in the mixed dry forests of the Prome District. Fl. March. •

3. *V. PUBESCENS*, Kurz in Journ. As. Soc. Beng. 1872. 314.

HAB. Here and there in the eng and the mixed dry forests from Ava and Martaban down to Pegu.—Fl. March, April.

### **Plectronia**, L.

(*Polyozus*, Miq., non Lour.)

#### *Conspectus of Species.*

\* *Pyrenes* quite smooth, triangular and almost keeled.

Unarmed, glabrous ; flowers in dichotomous elongate-branched cymes, .... *P. glabra*.

\* • *Pyrenes* more or less wrinkled and tubercled, rounded on the back.

× Unarmed shrubs or trees.

All parts glabrous and glossy; flowers cymose, ..... *P. didyma*.  
Branchlets and nerves of leaves pubescent; flowers on long capillary pedicels, solitary  
or paired, ..... *P. gracilipes*.

× × Armed with opposite (rarely ternary) sharp spines, which are usually decussately placed.

+ Branchlets more or less rusty or tawny pubescent.

Leaves pubescent on both sides, or hispid above; drupes the size of a pea, *P. parvifolia*.

Leaves glabrous, or the mid-rib beneath slightly pubescent; drupes the size of a small cherry, ..... *P. horrida*.

+ + All parts perfectly glabrous.

Leaves glossy, caudate-acuminato; flowers clustered, ..... *P. angustifolia*.

Leaves more or less blunt, glaucescent beneath ; flowers in peduncled cymes,  
.. *P. parvifolia*.

1. P. GLABRA, Bth. and Hf. (*Canthium glabrum*, Bl. Bydr. 967; DC. Prod. IV. 473; Miq. Fl. Ind. Bat. II. 254; *Canthium recurvum* Wall. MS. ap. Voigt Hort. Calc. 389).

**HAB.** In the tropical forests of the southern spurs of the Pegu Yomah and in Tenasserim ; also Andamans.—**Fl.** RS. ; **Fr.** Jan.

2. P. DIDYMA, Bth. and Hf. (*Canthium didymum*, Gaertn. Fruct. III. 94. t. 196; Roxb. Fl. Ind. ed. Wall. II. 171; WA. Prod. I. 425; Bedd. Fl. Sylv. t. 221; *Canthium umbellatum*, Wight Leon. t. 1034; *Canthium spirostylum*, Miq. Ann. Mus. Lugd. Bat. IV. 251; *Canthium lucidulum*, Miq. l. c. 254).

HAB. Tenasserim (Helf. 2972).

Two different species may really be included in the above synonymy. *Canthium oliganthum*, Miq. and *Canthium umbelligerum*, Miq. Ann. Mus. Lugd. Bat. IV. 251, are both referable to *Canthium lucidum*, Hook. and Arn.

3. P. GRACILIPES, Kurz For. Fl. Burm. II. 36 (*Canthium gracilipes*, Kurz in Journ. As. Soc. Beng. 1872. 311).

**HAB.** Rather frequent in the tropical forests of the Andamans, especially along the western side.—Fr. April, May.

Much resembling *Vangueria Miqueliana* (*Pyrostria*? *spinosus*, Mq. Fl. Ind. Bat. II. 313), but differs in the absence of spines, in its larger leaves, and in the different fruits.

4. P. PARVIFOLIA, Bth. and Hf. (*Canthium parvifolium*, Roxb. Fl. Ind. ed. Wall. II. 170; DC. Prod. IV. 474; *Canthium scandens*, Bl. Bydr. 966; Miq. Fl. Ind. Bat. II. 255).

**HA. B.** Not unfrequent in the low forests and in cleared shrubby places of the southern parts of Pegu: Chittagong (Roxburgh).—Fl. RS.

• 5. P. HORREIDA, Bth. and Hf. (*Canthium horridum*, Bl. Bydr. 966; DC. Prod. IV. 474; Miq. Fl. Ind. Bat. II. 255 and Ann. Mus. Lugd. Bat. IV. 251).

**HAB.** Tenasserim, Tavoy (Wall. Cat. 8298. C.)

6. *P. ANGUSTIFOLIA*, Bth. and Hf. (*Canthium angustifolium*, Roxb. Fl. Ind. ed. Wall. II. 169; DC. Prod. IV. 479; *Canthium Leschenaultii*, WA. Prod. I. 426; Wight Icon. t. 826).

HAB. Hills of Chittagong (Roxburgh).—Fl. March—July.

I have found another small-leaved glabrous unarmed shrub in the swamp-forests of Pegu apparently belonging to this genus, but unfortunately without flower or fruit. In habit it somewhat resembles *P. parviflora*, Bth. and Hf.—*Gardenia parvifolia*, Wall. Cat. 8256 from Tavoy, of the habit of *Damnacanthus*, is sterile and, therefore, indeterminable.

### Guetarda, L.

1. *G. SPECIOSA*, L. sp. pl. 1408; Roxb. Fl. Ind. I. 686; Wight Icon. t. 40; WA. Prod. I. 422; Bot. Reg. t. 1393.

HAB. Common in the beach-forests and generally along the sea-coasts of Tenasserim and the Andamans.—Fl. April, May.

### Polyphragmon, Desf.

(*Timonius*, Rumph.)

1. *P. FLAVESCENS*, (*Helospora flavescens*, Jack in Linn. Trans. XIV, 127. t. 4. f. 3.; DC. Prod. IV. 394; Miq. Fl. Ind. Bat. II. 234).

Var. *β. MACROCARPUM*, leaves larger and of thinner texture; drupes the size of a small cherry; seeds oblong, about 2 lin. long.

HAB. Var. *β.* in the tropical forests of South Andaman.—Fl. April, May; Fr. March.

Var. *β.* may be distinct, but the species of *Polyphragmon* belonging to the immediate affinity of *P. flavescens* are difficult to understand.

### Gardenia, L.

#### Conspectus of Species.

*Subg. 1. Eu-Gardenia.* Unarmed. Stipules more or less connate into a sort of a sheath. Flowers showy, salver-shaped, the tube long. Calyx various.

\* *Flowers and berries sessile or nearly so.*

Leaves almost sessile, scabrous; berries globular, in the forks of the branchings,

.. *G. obtusifolia.*

\* \* *Flowers (and berries) on short pedicels 3—5 lin. long.*

Leaves glabrous, with a tuft of hairs in the nerve-axils beneath; calyx-limb deeply 5-cleft; berry oblong, terete, ..... *G. resinifera.*

Leaves glabrous; calyx-limb laterally cleft and more or less spathaceous; berry oblong, more or less distinctly ribbed, ..... *G. coronaria.*

*Subg. 2. Campanularia.* Unarmed. Stipules connate or almost free. Corolla campanulate-funnel-shaped with a ventricose-inflated tube. Leaves glossy. Tree; leaves coriaceous, with a gland in the nerve-axils beneath; flowers large and showy, ..... *G. pulcherrima.*

Low shrub 1—3 ft. high; leaves membranous; flowers middling-sized, white,

.. *G. hygrophila.*

*Subg. 3. Randioides.* *Randia*-like trees or shrubs, armed with opposite sharp spines (abortive branchlets). Stipules free, very deciduous. Flowers comparatively small.

\* *All parts (also the leaves) glabrous. Calyx-lobes herbaceous or leafy.*

Leaves more or less lanceolate; flowers pedicelled, by 2 or more clustered; calyx about 2 lin. long, ..... *G. campanulata.*

\* \* *All parts more or less pubescent, villous, or tomentose.*

× Fertile flowers sessile, hermaphrodite-sterile ones in cymes. Calyx-lobes herbaceous or leafy. Flowers green.

Bark grey; fertile and sterile flowers on the same plant; berries plumply beaked, torete, ..... *G. sessiliflora.*

Bark red; fertile and sterile flowers usually on separate trees; berries slightly ribbed, ..... *G. erythroclada.*

× × All flowers fertile, or at least the fruits all conform and equally well developed. Calyx truncate or minutely toothed. Flowers white or yellow.

Calyx puberulous; berry smooth; branches silvery white; leaves quite glabrous,

..... *G. cuneata.*

Calyx minutely pubescent; berry roughish, glabrous; branchlets grey; leaves pubescent beneath, ..... *G. turgida.*

Calyx velvety-tomentose; berry densely brown-velvety, ..... *G. dasycarpa.*

1. • *G. obtusifolia*, Roxb. Hort. Beng. 15; Kurz For. Fl. Burm. II. 42 (*G. suavis*, Wall. Cat. 8274).

HAB. Frequent in the eng and dry forests from Prome and Martaban down to Upper Tenasserim.—Fl. March, April; Fr. the following year.

2. *G. resinifera*, Roth Nov. spec. 150, non Korth. (*G. lucida*, Roxb. Fl. Ind. I. 707; WA. Prod. I. 395; DC. Prod. IV. 395; Wight Icon. t. 575).

HAB. Chittagong (Roxb.).

3. *G. coronaria*, Ham. in Symes Embassy Ava. 474. c. tab. (*Gard. costata*, Roxb. Fl. Ind. I. 704; DC. Prod. IV. 380; *G. carinata*, Griff. Not. Digot. 261. t. 474. f. 3).

HAB. Frequent in the moister mixed forests, rare in the low forests of Pegu, Martaban, and Tenasserim; also Chittagong.—Fl. April; Fr. the following year.

4. *G. pulcherrima*, Kurz in Journ. As. Soc. Beng. 1872. 312.

HAB. Not unfrequent in the tropical forests of the Andamans.—Fl. May; Fr. April of the following year.

*G. ? ixorifolia*, R. Br. in Wall. Cat. 8262, from Tavoy (leaves only), is near allied to the above, but apparently different.

5. *G. hygrophila*, Kurz in Journ. As. Soc. Beng. 1872. 312.

HAB. Frequent in the swamp-forests and in swampy places in the savannahs of the Irrawaddi alluvium in Pegu and the Prome district.—Fl. Jap.

6. *G. campanulata*, Roxb. Fl. Ind. I. 710; DC. Prod. IV. 383; Wight Icon. t. 578.

HAB. Chittagong ; in the tropical forests of Pegu above Rangoon ; Upper Tenasserim, Ta-oo table-land (Dr. Brandis).

7. *G. SESSILIFLORA*, Wall. Cat. 8291 ; Kurz in For. Fl. Burm. II. 40.

HAB. Frequent in the mixed and dry forests, especially in the lower mixed ones and in the savannahs, all over Burma, from Ava and Martaban down to Tenasserim.—Fl. April—May ; Fr. CS.

8. *G. ERYTHROCLADA*, Kurz in Journ. As. Soc. Beng. 1872. 311.

HAB. Common in the mixed and dry forests all over Burma, from Ava and Martaban down to Upper Tenasserim.—Fl. April, May ; Fr. CS.

9. *G. CUNEATA*, R. Br. MS. ; Kurz For. Fl. Burm. II. 41 (*Randia cuneata*, Wall. Cat. 8263).

HAB. Ava, left bank of the Irrawaddi below Ava.—Fr. Sept.

10. *G. TURGIDA*, Roxb. Fl. Ind. I. 711 ; DC. Prod. IV. 382 ; Wight Icon. t. 579.

HAB. Frequent in the eng and dry forests of Prome and of the Irrawaddi zone of Pegu.—Fl. March, April ; Fr. March of the following year.

11. *G. DASYCARPA*, Kurz in Journ. As. Soc. Beng. 1872. 412 (*Gard. tomentosa*, Wall. Cat. 8264, non Bl.).

Not unfrequent in the mixed dry and the eng-forests of the Prome District ; also in Upper Tenasserim.—Fl. April ; Fr. the following year.

### ***Randia*, L.**

#### *Conspectus of Species.*

\* *Corolla almost rotate, large (up to nearly 1½ in. across).*

Leaves glossy, glabrous ; berries large, sessile or peduncled, ..... *R. uliginosa*.

\* \* *Corolla salver-shaped, rather small (about 4 lin. in diameter or less.)*

Glabrous or sparingly hirsute ; calyx glabrous or nearly so ; berries glabrous or sprinkled with minute hairs, ..... *R. longispina*.

More or less shortly puberulous ; calyx densely pubescent or almost villous ; berries tawny-velvety, ..... *R. nutans*.

1. *R. ULIGINOSA*, DC. Prod. IV. 386 ; WA. Prod. I. 398 ; Wight Icon. t. 397. (*Posoqueria uliginosa*, Roxb. Fl. Ind. I. 712 ; *Gardenia uliginosa*, Retz. Obs. II. 14 ; Roxb. Corom. Pl. II. t. 135).

HAB. Frequent in the savannahs and in swampy grounds all over Burma, from Ava and Martaban down to Upper Tenasserim.—Fl. April—June ; Fr. CS.

This species, and likely all true species of *Randia*, exhibit the same peculiar dimorphism of the fruit as some species of section *Randioides* of *Gardenia*. But here the peduncled fruits differ only in size, while they produce perfect seeds.

2. *R. LONGISPINA*, DC. Prod. IV. 386 ; WA. Prod. I. 398. (*Posoqueria longispina*, Roxb. Fl. Ind. I. 716 ; *Randia* sp. Griff. Not. Dicot. 261 ?).

HAB. In the tropical forests of the southern slopes of the Pegu Yomah.—Fl. April; Fr. May—July.

3. *R. NUTANS*, DC. Prod. IV. 386; WA. Prod. I. 397 (*Posoqueria nutans*, Roxb. Fl. Ind. ed. Wall. II. 565).

HAB. Common in the mixed forests all over Pegu and Martaban.—Fl. April; Fr. May—July.

### *Doubtful Species.*

1. *R. exaltata*, Griff. Not. Dicot. 262.

HAB. Tenasserim, Mergui, in low lands, with mangroves, Pullow (Griff.).—Fl. Fr. Jan.

2. *R. polysperma*, Roxb. Fl. Ind. ed. Wall. II. 147.

HAB. Chittagong.—Fl. May; Fr. Aug., Sept.

N. B. No *Randia*, but indeterminable for the present.

### *Webera*, Schreb.

#### *Conspectus of Species.*

*Subg. 1. Eu-Webera.* Stigma entire. Erect shrubs or trees, unarmed.

\* *Cymes terminal or in the forks of the branchings.*

All parts\* (also the inflorescence) quite glabrous, ..... *W. Asiatica*.

Glabrous; inflorescence grey pubescent, ..... *W. glomeriflora*.

\* *Cymes or corymbs leaf-opposed.*

All parts glabrous; cymes puberulous, ..... *W. oppositifolia*.

*Subg. 2. Griffithia*, WA. Stigma 2-lobed. Shrubs, often scandent, armed with straight or recurved spines.

\* *Spines recurved. Scandent shrubs.*

× Inflorescence quite glabrous.

Corolla-tube  $\frac{3}{4}$ —1½ in. long, ..... *W. longiflora*.

Corolla-tube hardly longer than the calyx (2 lin. long), ..... *W. Siamensis*.

× × Inflorescence and calyx appressed-pubescent.

Corolla-tube about 3 lin. long, ..... *W. bispinosa*.

● \* *Spines straight. Erect or straggling shrubs.*

Flowers sessile or almost sessile between 2 connate bractlets, ..... *W. fasciculata*.

Flowers solitary, on a slender bractless pedicel, ..... *W. myrtifolia*.

1. *W. GLOMERIFLORA*, Kurz in Journ. As. Soc. Beng. 1872: 311.

HAB. Rare in the tropical forests of the interior parts of the Pegu Yomah (head-waters of the Toungnyo choung).—Fl. probably March or April; Fr. Febr.

The leaves are exactly like those of *Griffithia rugulosa*, Thw.

2. *W. OPPOSITIFOLIA*, Roxb. Fl. Ind. ed. Wall. II. 525. (*W. densiflora*, Wall. in Roxb. Fl. Ind. II. 536; *Stylocoryne densiflora*, Miq. in Ann. Mus. Lugd. Bat. IV. 128. t. 5. fig. A.; *Cupania densiflora*, DC. Prod. IV. 394; *Randia densiflora*, Bth. Fl. Hongk. 155; *Gynopachys axilliflorus*, Miq. in Fl. Ind. Bat. II. 221).

Var. *a. GENUINA*, calyx 2 lin. long or somewhat longer, the limb

more bell-shaped, almost glabrous; flowers in shorter cymes; berries the size of a large pea.

? Var.  $\beta$ . *FLORIBUNDA*, calyx about  $1\frac{1}{2}$  lin. long or shorter, densely pubescent, the limb shorter; flowers in densely pubescent slender divaricate corymbs; berries half the size.

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban to Tenasserim and the Andamans; also Chittagong; var.  $\beta$ . in the tropical forests of the Andamans, rather frequent.—Fl. April June; Fr. Oct.

3. *W. LONGIFLORA*, (*Randia longiflora*, Lamk. Diet. III. 26; DC. Prod. IV. 386; *Posoqueria longiflora*, Roxb. Fl. Ind. ed. Wall. II. 569; *Griffithia fragrans*, Miq. Fl. Ind. Bat. II. 208, non WA.).

HAB. Rather frequent in the tropical forests of the Andamans and Tenasserim; also Chittagong.—Fl. March—May; Fr. June, July.

This, as other species of *Griffithia*, have the cymes not strictly axillary but arising from the end of, or laterally from, the transformed spine-like branchlets.

4. *W. SIAMENSIS*, (*Griffithia Siamensis*, Miq. Ann. Mus. Lugd. Bat. IV. 130; *Canthium* ? *angulosum*, Wall. Cat. 8285. A.).

HAB. Upper Tenasserim (Wall.).—Fl. March.

5. *W. BISPINOSA*, (*Stylocoryne bispinosa*, Griff. Not. Dicot. 260).

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. April, May.

6. *W. FASCICULATA*, (*Posoqueria fasciculata*, Roxb. Fl. Ind. ed. Wall. 568; *Posoqueria rigida*, Wall. in Roxb. l. c. 570; *Randia rigida*, and *R. fasciculata*, DC. Prod. IV. 386).

HAB. Tenasserim, about Moulmein (Rev. Parish).

7. *W. MYRTIFOLIA*, Kurz For. Fl. Burm. II. 49 (*Gardenia myrtifolia*, Wall. Cat. 8255. D.)

HAB. Frequent in the swamp-forests of the Irrawaddi alluvium in Pegu; Tenasserim, Moulmein (Wall.).—Fl. May.

### **Diplospora, DC.**

1. *D. SINGULARIS*, Korth. in Ned. Kruidk. Arch. II. 200; Miq. Fl. Ind. Bat. II. 238 and Ann. Mus. Lugd. Bat. IV. 250. (*Discospermum sphaerocarpum*, Dalz. in Hook Kew Journ. Bot. II. 257 ?)

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and more frequent in those of Martaban, Tenasserim, and the Andamans.—Fl. April, May.

### **Hypobathrum, Bl.**

#### *Conspectus of Species.*

Subg. 1. *Petunga*, DC. Flowers 4-merous; the calyx-limb persistent. Berry contracted into a longer or shorter stalk (the elongating pedicel).

Glabrous; flowers in axillary spikes, ..... *H. racemosum*.

Subg. 2. *Hyptianthera*, WA. Flowers 5- rarely 4-merous, the calyx-limb persistent. Berry sessile.

Glabrous; flowers in axillary clusters, ..... *H. strictum*.

1. *H. RACEMOSUM*, (*Randia racemosa*, Roxb. Fl. Ind. I. 144; *Petunga Roxburghii*, DC. Prod. IV. 399; *Petunga variabilis*, Hassk. Cat. Hort. Bog. 114; Miq. Fl. Ind. Bat. II. 201, cum syn.).

HAB. Not unfrequent in the swamp-forests and in swampy or marshy places along choungs or around lakes of Pegu and Martaban, and no doubt elsewhere.—Fl. Oct.—Dec.; Fr. Dec.—April.

2. *H. STRICTUM*, (*Hyptianthera stricta*, WA. Prod. I. 399; *Randia stricta*, Roxb. Fl. Ind. I. 526; *Rondeletia stricta*, Roth Nov. sp. 140).

HAB. Chittagong (Hf. and Th.); Ava, Bhamo (J. Anderson).—Fl. Sept.; Fr. Febr.

### Brachytome, Hf.

1. *B. WALLICHII*, Hf. Icon. plant. t. 1088.

HAB. Ava (Griff. 2787); Kakhyen hills (J. Anderson).—Fl. April.

Inflorescence, flowers, and berries very like those of *Saprosma ternatum*, but the last are many-seeded.

### Morindopsis, Hf.

1. *M. CAPILLARIS*, Kurz in Journ. As. Soc. Beng. 1874. 189 (*Psilobium capillare*, Kurz l. c. 1873. 313).

HAB. Frequent in the swamp-forests of Pegu and Martaban down to Tenasserim.—Fl. April, May.

### Mussaenda. L.

#### Conspectus of Species.

\* Calyx-limb deciduous, leaving an angular scar at the top of the berry.

• x Calyx-teeth  $\frac{1}{2}$ —1 lin. long.

Calyx-teeth erect, lanceolate; branchlets puberulous or velvety, ..... *M. glabra*.

Calyx-teeth as in preceding but reflexed; branchlets hirsute, ..... *M. variolosa*.

x x Calyx-lobes 2—4 lin. long.

Calyx-lobes filiform, 2—2 $\frac{1}{2}$  lin. long, all conform and none expanded leaf-like,

.. *M. pavettaefolia*.

Calyx-lobes linear, 2—3 lin. long; corolla-lobes nearly half as long as the corolla-tube,

.. *M. macrophylla*.

Calyx-lobes lanceolate, about  $\frac{1}{2}$  in. long; corolla-lobes about  $\frac{1}{4}$  as long as the corolla-tube, ..... *M. calycina*.

\* \* Calyx-limb persistent, crowning the berry.

Calyx-teeth linear-subulate, about 4 lin. long; corymbs rather compact, *M. corymbosa*.

1. *M. GLABRA*, Vhl. Symb. III. 38; DC. Prod. IV. 370.

Var.  $\alpha$ . *GENUINA*, more glabrous, especially the leaves and branches.

Var.  $\beta$ . *WALLICHII*, (*M. Wallichii*, Don. Gen. Syst. III. 490), leaves pubescent beneath and along the nerves above, petioles shorter.

**HAB.** In the drier hill-forests of Martaban east of Tounghoo, at 3000 to 4000 ft. elevation.—Fl. Fr. March.

2. *M. VARIOLOSA*, Wall. Cat. 6259 ; Don. Gen. Syst. III. 490 ; Miq. Fl. Ind. Bat. II. 215.

**HAB.** Rather rare in the tropical forests of the southern parts of the Pegu Yomah, more frequent in Tenasserim from Moulmein southwards ; also Arracan, Sandoway, &c.—Fl. Sept.—Febr.

*M. parva*, Wall. Cat. 6261 (Don. Gen. Syst. III. 491) from Tavoy, possibly belongs here, but the only specimen seen by me is not sufficient for a correct identification.

3. *M. PAVETTÆFOLIA*, Kurz For. Fl. Burm. II. 57.

**HAB.** Not unfrequent in the tropical forests of Martaban, east of Tounghoo.—Fl. June ?

The leaves much resemble those of the glabrescent form of *Ixora tomentosa*.

4. *M. MACROPHYLLA*, Wall. in Roxb. Fl. Ind. II. 228 ; DC. Prod. IV. 371, non Schum.

**HAB.** Frequent in the tropical forests of the Andamans, especially along the coasts.—Fl. May, June ; Fr. June, July.

5. *M. CALYCINA*, Wnll. Cat. 6253 ; Don. Gen. Syst. 489 ; Miq. Fl. Ind. Bat. II. 214.

**HAB.** Not unfrequent in the mixed and mixed dry forests, from Ava and Prome to Pegu, especially along chougns.

6. *M. CORYMBOSA*, Roxb. Fl. Ind. ed. Wall. II. 226 ; DC. Prod. IV. 371 ; WA. Prod. I. 393.

**HAB.** Not unfrequent in the upper mixed forests of the Kolodyne district in Arracan ; also Upper Tenasserim, Moulmein (Falconer).—Fr. Octob.

### **Acranthera, Arn.**

1. *A. UNIFLORA*, Kurz in Journ. As. Soc. Beng. 1872. 312. (*Mussaenda uniflora*, Wall. Cat. 6264 ; Don. Gen. Syst. III. 491).

**HAB.** Tenasserim, Moulmein, in woods, plentiful (R. Scott) ; Tavoy (Wall.).—Fl. June ; Fr. Aug.

### **Adenosacme, Wall.**

1. *A. LONGIFOLIA*, Wall. Cat. 6280 A ; Miq. Fl. Ind. Bat. II. 217. (*Rondeletia longifolia*, Wall. in Roxb. Fl. Ind. II. 138).

**HAB.** Rare in the tropical forests of the southern and eastern slopes of the Pegu Yomah ; more frequent in those of Martaban and Tenasserim, up to 3000 ft. elevation.—Fr. Jan.—March.

In the tropical forests of the valleys of the Nattoung hills (Martaban) grows another species, apparently new, which has very short thick petioles and the uppermost leaves almost sessile; but the specimens are too bad for description.

### **Myrioneuron, R. Br.**

#### *Conspectus of Genera.*

Glabrous; cymes compact and head-like, densely bructed, nodding; bracts subulate, rigid, ..... *M. nutans*.  
Branches hirsute; cymes corymb-like, trichotomous, hirsute, erect; bracts broad, membranous, hirsute, ..... *M. hirsutum*.

1. *M. NUTANS*, R. Br. in Wall. Cat.; Kurz For. Fl. II. 55.

HAB. Chittagong-hills, Kassalong (C. B. Clarke).—Fr. CS.

2. *M. HIRSUTUM*, Kurz For. Fl. Burm. II. 55.

HAB. Ava, hills east of Bhamo (J. Anderson).—Fl. May.

### **Urophyllum, Jack and Wall.**

#### *Conspectus of Species.*

\* Ovary and berry 5—6-celled. Flowers in shorter or longer simple or compound umbels or cymes.

Leaves and shoots glabrous; calyx about 2 lin. across, ..... *U. glabrum*?

Leaves beneath and shoots more or less pubescent; calyx a line across, .. *U. strigosum*.

\* \* Ovary and berry 2-celled. Flowers in sessile clusters.

All parts glabrous; flowers minute, ..... *U. biloculare*.

1. *U. GLABRUM*, Jack and Wall. in Roxb. Fl. Ind. II. 184; DC. Prod. IV. 441. (*Axanthes longifolia*, Wight in Maccl. Calc. Journ. VII. and Leon. t. 1165).

HAB. Tenasserim, Mergui (*teste* Wight).

2. *U. STRIGOSUM*, Korth. in Ned. Kruidk. Arch. II. 194; Miq. Fl. Ind. Bat. II. 223.

HAB. Tenasserim (or Andamans?) (Helf. 2940 and 2944).

3. *U. BILOCULARE*, Kurz in Journ. As. Soc. Beng. 1872\* 313.

HAB. Rather rare in the tropical forests of the Martaban hills east of Tounghoo.—Fr. March.

### **Rubia, L.**

#### *Conspectus of Species.*

Leaves more or less cordate-ovate, long-petioled, 3—5-nerved, ..... *R. cordifolia*.  
Leaves narrow-linear, sessile, 1-nerved, ..... *R. angustissima*.

1. *R. CORDIFOLIA*, L. Mant. 197; DC. Prod. IV. 588; WA. Prod. I. 442; Miq. Fl. Ind. Bat. II. 337. (*R. Munjista*, Roxb. Fl. Ind. ed. Wall. I. 383; *R. scandens*, Zoll. and Mor. Syst. Verz. 66; *R. purpurea*, Dene. Mém. Acad. Brux XI; Jacq. Voy. Bot. 84. t. 92).

Var. *a. GENUINA*, leaves various, more or less scabrous on the upper side and on the margins and on the nerves beneath, but not pubescent.

Var. *β. AFFINIS*, (*Rubia affinis*, Wall. Cat. 6209), leaves scabrous above, softly but shortly pubescent beneath.

HAB. Var. *β. Ava*, on Taong-dong (Wall.).—Fl. Fr. Nov.

2. *R. ANGUSTISSIMA*, Wall. Cat. 6207; G. Don. Gen. Syst. III. 643; Walp. Rep. II. 460. (*R. charaefolia*, Wrl. Cat. 6210; G. Don. l. c.; Walp. l. c.).

HAB. *Ava*, Taong-dong (Wall.).—Fl. Fr. Nov.

### Galium, L.

1. *G. ASPERIFOLIUM*, Wall. in Roxb. Fl. Ind. I. 381; DC. Prod. IV. 598; WA. Prod. I. 442.

HAB. In open grassy places along the borders of the stunted hill-forests on Nattoung, Martaban, at about 7000 ft. elevation; *Ava*, Klakyeen hills (J. Anderson).

## DIPSACEÆ.

### Conspectus of Genera.

\* *Flowers not in heads, cymose or whorled.*

TRIPLOSTEGIA. Cymes dichotomous and laxly paniced. Stamens 4. Stigma terminal, straight. Small herbs.

\* \* *Flowers in terminal rarely axillary often peduncled heads.*

DIPSACUS. Involucre-bracts usually herbaceous, the paleas of the receptacle rigid or spinescent. Corolla 4-cleft. Rigid herbs, the flower-heads large.

### Dipsacus, L.

1. *D. STRICTUS*, Don Prod. Fl. Nep. 161; DC. Prod. IV. 646.

Var. *a. GENUINA*, (*D. strictus*, Don. l. c.; *D. inermis*, Wall. in Roxb. Fl. Ind. I. 367), stems more or less retrorsely hispid; leaves more or less pilose.

Var. *β. MITIS*, (*D. mitis*, Don Prod. Nep. 161; *D. inermis*, Coult. Dips. 23; DC. Prod. IV. 646; *D. longicaulis*, Wall. Cat. 6856), leaves on the nerves beneath and corners of the stems sparingly beset with minute prickles, otherwise glabrous or nearly so.

HAB. Martaban, plateau of the Yoonzeleen, at 2500 ft. elevation (Dr. Brandis); *Ava*, Taong-dong (Wall.).—Fl. March, April.

## COMPOSITÆ.

### Conspectus of Genera.

Subord. I. *ASTERACEÆ*. Florets all tubular or bilabiate, or more usually the outer ones ligulate and forming a ray. Style-branches in the female florets always filiform, those of the hermaphrodites variously shaped (in the sterile florets sometimes the style simple). Herbs, shrubs, or rarely trees; the sap usually watery, never milky.

*Trib. I. Corymbiferae*, Vaill. Florets all tubular, or more usually the marginal ones ligulate and forming a ray. Style not thickened joint-like at or near the apex. Herbs, shrubs, or trees, usually aromatic.

\* *Flower-heads heterogamous, radiate or discoid, the hermaphrodite or male florets tubular, and the female ones ligulate or filiform (or rarely the heads homogamous in absence of the ray-florets).*

+ Anthers free or nearly so. Female flowers all apetalous.

Flower-heads unisexual, rarely heterogamous.

*Subtrib. 1. AMBROSIEÆ.* Style of hermaphrodite florets undivided. Anthers inflexed-appendaged. Pappus none. Leaves alternate.

*XANTHIUM.* Male florets numerous, in globular heads, the involucre small, consisting of free bracts in a single row. Female florets 2 together consolidated with the involucre into a prickly burr.

+ + Anthers always united into a tube. Style-branches truncate or appendaged.

× Pappus of short stiff awns or scales, or reduced to a raised border, or none at all. (*Genera with a similar or no pappus, not included here, should be sought for in the next division with capillary bristles*).

Anther-cells not tailed at the base.

*Subtrib. 2. HELIANTHOIDEÆ.* Flowers either heterogamous, with the female florets more or less ligulate, the central ones tubular hermaphrodite or male, or rarely discoid, with all the florets hermaphrodite and tubular. Receptacles with chaffy scales between the florets, or rarely (in *Helentioideæ*) naked. Anthers without tails. Style branches truncate and penicillate, or appendiculate, or the style of the sterile flowers undivided. Pappus of stiff awns or of short scales or none. Achenes 3—4-gonous, terete, or more usually variously compressed. Leaves opposite or rarely alternate.

\* *Receptacle palmaceous (Helianthoidæ).*

+ + Pappus consisting of numerous scales, rarely awn-shaped (or none). (*Galinsogææ*).

*GALINSOGA.* Flower-heads radiate. Involucral bracts in 1 or 2 series, almost equal. Scales of pappus oblong, chaffy, fringed, or the alternate ones, or all, shortly awned. Herbs, leaves opposite. Receptacle conical.

*TRIDAX.* Flower-heads radiate. Involucral bracts in 2 rows, membranous, or the outer ones herbaceous. Scales of pappus feathery-fringed. Herbs, leaves opposite. Receptacle flat or rarely so.

+ + Pappus consisting of only 1—4 bristly awns, or cyathiform, or absent.

• × Corolla of the fertile florets persistent on the achenes. Pappus of 1—3 awns (*Zinniaæ*).

*ZINNIA.* Receptacle conical or cylindrical. Disk-florets fertile. Achenes (at least the inner ones) 1—3-angled. Herbs, leaves opposite. Flower-heads solitary.

• × Corolla of all the flowers deciduous.

† Achenes more or less compressed from the top. Pappus of 2 (rarely 4) bristles, or none. (*Coreopsidææ*).

‡ Involucral bracts distinct, almost equal, the outer ones herbaceous, the inner almost conform to the scales of the receptacle.

GUIZOTIA. Ray-florets fertile. Achenes small, almost 4-cornered, without pappus, but crowned with the densely pilose corolla-base. Flower-heads peduncled. Leaves opposite, or the upper ones alternate.

SYNEDRELLA. Ray-florets fertile. Achenes almost flat, lacerate-winged, crowned with 2—3 awns. Herbs, leaves opposite. Flower-heads sessile or peduncled.

‡ ‡ Involucral bracts in 2 rows, the inner ones membranous, often connate at the base or higher up, the outer ones small or minute.

§ Style-branches truncate, pedicellate or overtopped by a short appendage.

CONTOPSIS. Ray-florets sterile or rarely fertile or none. Style-branches penicillate or truncate, with a short or obsolete appendage. Achenes flat, ciliate, or winged, rarely contracted at the top, nude or more usually terminated by 2 short awns. Leaves opposite or alternate, single to pinnatisect.

DAHLIA. Ray-florets sterile, rarely fertile. Style-branches terminating in an elongate hairy appendage. Achenes flat, wingless, naked. Leaves opposite, pinnate.

BIDENS. Ray-florets sterile, rarely fertile or none. Involucral bracts free or connate only at the base. Style-branches terminating in a short acute or shortly subulate appendage. Achenes not beaked, crowned with 2—4 stiff awns finally minutely retrorsely bearded or aculeate. Leaves opposite, simple to pinnatisect.

COSMOS. Ray-florets sterile, often rose-coloured or violet. Achenes more or less beaked. Rest as in *Bidens*. Leaves opposite, simple to pinnatisect.

GLOSSOCARDIA. Ray-florets fertile, usually solitary. Achenes narrow, flat, long-ciliate, crowned with 2 stiff smooth awns recurved afterwards. Leaves alternate, pinnatisect.

§ § Style-branches terminating in a long, shortly hairy appendage.

GLOSSOGYNE. Ray-florets fertile. Achenes long, crowned with 2 or 3 stiff persistent awns. Leaves mostly radical, dissect to 3-toothed, the cauline ones few and small.

CHRYSANTHELLUM. Ray-florets fertile. Achenes naked, those of the disk compressed with the inner ones often winged, those of the ray thick. Leaves alternate, dissect.

† † Achenes all thick, or those of the ray triquetrous, those of the disk laterally compressed. Pappus cyathimorph or of 2—3 stiff chaffy or bristly awns, with or without intermediate scalelets, or none (*Verbesinaceæ*).

‡ Inner involucral bracts (or outer scales of the receptacle) embracing or enveloping the achenes of the fertile ray-florets. Pappus none or of minute free scales.

ENHYDRA. Involucre of 4 broad leafy bracts, the 2 outer larger than the 2 inner. Ray-florets in several rows, with very small ligules. Pappus none. Aquatic herbs, with simple opposite leaves. Flower-heads axillary, sessile or nearly so.

SIEGESBECKIA. Outer involucral bracts leafy, narrow, spreading, gland-hairy, the inner ones and the receptacle-scales enveloping the florets. Ray-florets in a single row with small ligules or almost bell-shaped. Pappus none. Herbs with opposite leaves. Flower-heads paniced.

‡ ‡ Inner involucral bracts all flat.

§ Scales of receptacle flat, very narrow, usually only few.

ECLIPTA. Involucral bracts in 2 or 3 rows, the outer ones ovate-oblong. Disk-florets 4-toothed. Ligules small, almost 2-seriate. Pappus none or shortly 2-awned. Stylo-branches obtuse and flattened. Herbs, leaves simple, opposite.

§ § Scales of receptacle concave or complicate, more or less embracing or enveloping the disk-florets.

‡ Achenes wingless, compressed or 4—5-cornered.

Δ Pappus united at the base into a ring or cup.

Flower-heads small or rather small.

BLAINVILLEA. Ray-florets fertile, with small ligules. Disk-achenes crowned with 2—5 persistent awns united at the base into a cup or ring. Herbs, leaves opposite or the upper ones alternate. Flower-heads peduncled or almost sessile. Florets white.

WEDELIA. Ray-florets fertile, with conspicuous spreading ligules. Disk-achenes crowned by numerous minute scales or fringes or by 1—2 short deciduous awns united at base into a cup or ring, or rarely the pappus very minute or obsolete. Herbs, leaves opposite, simple. Flower-heads peduncled or almost sessile. Florets yellow.

Δ Δ Pappus-scales or awns free from the base. Flower-heads usually large.

‡ ‡ Achenes of the disk laterally compressed (those of the ray sometimes dorsally compressed or 3-quetrous), ciliate or winged on the margins. Flower-heads small.

SPILANTHES. Ray-florets, if present, fertile. Stylo-branches truncate and not appendaged. Achenes usually ciliate. Awns of pappus if present very thin. Herbs, leaves opposite. Receptacle conical.

TITHONIA. Ray-florets sterile. Awns of the pappus deciduous or persistent, the intermediate scalelets persistent. Involucre-bracts striate at the base, stiff, elongate-leafy at apex. Tall herbs, leaves alternate. Flower-heads on thickened peduncles.

HELIANTHUS. Ray-florets, if present, sterile. Awns of the pappus deciduous, often paleaceous, without intermediate scalelets. Tall herbs, leaves usually simple, opposite or alternate.

\* \* Receptacle naked (Helenioides).

TAGIUS. Involucre-bracts oily-glandular, in a single row, united into a toothed cup. Pappus of 5—6 unequal scales or awns. Flower-heads usually radiate. Herbs, leaves opposite, pinnatisect or serrate.

Subtrib. 3. CALENDULACEÆ. Flower-heads usually heterogamous, the ray-florets ligulate, female or rarely neuter, the disk-florets tubular, hermaphrodite, but sterile or rarely fertile (very rarely the heads homogamous and discoid). Receptacle naked. Anthers usually with sagittate, but scarcely tailed base. Stylo-branches in the disk-florets more or less concrete and thickened at the base. Achenes often heteromorph and variously curved. Pappus none, or replaced by a woolly crown. Leaves alternate, or radical.

CALENDULA. Rays rather long, spreading. Achenes much incurved, muricate on the back, the margins sometimes dilated but not winged, those of the disk all abortive. Pappus none.

Subtrib. 4. ANTHEMIDEÆ. Flower-heads heterogamous, the females ligulate or filiform or without corollas, the disk-florets hermaphrodite or male, or very rarely all the florets tubular and hermaphrodite. Receptacle naked, or very rarely scaly. Anthers

tailless. Style-branches truncate or penicillate, rarely shortly appendaged. Pappus none, or reduced to a raised border or rarely of short scales. Leaves usually alternate.

\* *Receptacle paleaceous. Flower-heads radiate, or rarely homomously discoid.*

ACHILLEA. Involucre ovoid, bell-shaped or rarely hemispherical. Achenes compressed, narrowly margined. Herbs or undershrubs, the leaves alternate.

\* \* *Receptacle naked, or alveolate-fibrillose.*

× Flower-heads radiate. Involucre bracts rather broad.

CHRYSANTHEMUM. Receptacle flat or convex. Achenes regularly or irregularly 5—10-ribbed. Pappus none, or rarely of very short scales or forming a cup.

× × Flower-heads heterogamous, discoid. (*Cotulae*).

+ Florets of the circumference few. Achenes obovate or rounded at the top.

ARTEMISIA. Involucre-bracts in few rows. Achenes almost terete or compressed, 2- or thinly many-ribbed or without ribs. Herbs or undershrubs, the leaves dissect to simple. Flower-heads small, in racemes or paniced racemes.

+ + Florets of circumference very numerous. Achenes flat or concave at the top. Flower-heads spherical or hemispherical.

COTULA. Florets of the circumference without any or with a very short broad or conical corolla, the hermaphrodite florets 4-toothed, with a widened or thin tube. Achenes flat, obtuse or truncate. Flower-heads peduncled. Small herbs.

MYRIOGYNE. Florets of the circumference with a 2—3-cleft corolla nearly as long as the style, the hermaphrodite florets 4-toothed. Bracts of involucre small and much shorter than the 3—4-cornered achenes. Flower-heads sessile, minute. Prostrate herbs.

CENTIPEDA. As preceding but involucre bracts large and broad, in fruit connivent and covering the cylindrical slightly striate achenes. Prostrate herbs. Flower-heads sessile, small.

× × Pappus usually of numerous capillary soft bristles, (rarely paleaceous or none).

O Anthers tailed at the base.

*Subtrib. 5. INULOIDEÆ.* Flower-heads heterogamous, discoid or radiate, or homogenous in absence of the ray-florets. Anther-cells terminating in a basal bristle or tail. Style-branches linear, obtuse and not appendaged (or the style undivided in the sterile florets). Leaves usually alternate.

\* *Female flowers if present ligulate.*

× Bristles of pappus all conform and almost equal, capillary, copious.

INULA. Flower-heads heterogamous. Involucre-bracts in many rows, narrow or leafy-appendaged. Ray-florets few, in 1 or 2 rows, disk-florets numerous. Anthers with double tails. Achenes not or 4—5-ribbed. Herbs or undershrubs.

\* × × Pappus unequal, the outer consisting of short bristles or more usually of minute scales, rarely no pappus at all.

+ Pappus present (rarely absent).

PULICARIA. Flower-heads heterogamous, the ray-florets in 1 or 2 rows, yellow. Involucre broad, the bracts narrow, in few rows, the outer ones herbaceous. Achenes ribbed or not. Bristles of inner pappus in a single row, the outer pappus of very short scales more or less connate into a crown or slit cup.

**VICOA.** Flower-heads heterogamous or homogamous. Involucre usually broad, the bracts narrow, in many rows. Achenes hardly ribbed. Bristles of pappus very thin, in a single row, rarely intermixed with a few minute scales.

+ + Pappus none.

**CARPESUM.** Flower-heads heterogamous, the female flowers tubular in numerous rows. Achenes many-ribbed, beaked. Herbs.

\* \* Female flowers if present filiform.

× Style-branches of hermaphrodites usually truncate. Flower-heads androgynous or unisexual, or homogamous. Involucre-bracts usually scarious, hyalino or petaloid (*Gnaphalieæ*).

+ Flower-heads 1-flowered. Pappus none.

**CÆSULIA.** Flower-heads clustered, axillary, of 2 bracts only, inserted to the broad receptacle and surrounded by a leafy involucre. Aquatic herbs, the leaves simple.

+ + Flower-heads many-flowered.

† Flower-heads androgynous, usually with more female than hermaphrodite florets, or more or less unisexual, dioecious or monœcious, clustered or distinct. Involucre-bracts rarely petaloid.

O Hermaphrodite florets all sterile, the style usually entire or scarcely and only very shortly 2-cleft.

**ANTENNARIA.** Flower-heads strictly dioecious, in dense corymbs or rarely solitary. Bristles of pappus united at the base into a ring. Inflorescence not involucred.

**LEONTOPODIUM.** Flower-heads unisexual or androgynous, monœcious or incompletely dioecious, clustered or in dense cymes. Bristles of pappus united at the base into a ring. Inflorescence involucred by the floral leaves.

**ANAPHALIS.** Flower-heads androgynous or incompletely dioecious, in corymbs, rarely few or solitary. Bristles of pappus free from the base. Inflorescence not involucred.

O O Most or all hermaphrodite florets fertile. Style deeply 2-cleft.

**GNAPHALIUM.** Flower-heads more or less androgynous, usually small and clustered, rarely solitary, the involucreal bracts scarious, often coloured. Ray-florets very numerous, disk-florets few. Bristles of pappus not feathery, free or united at the base into a ring.

† † Flower-heads androgynous with usually fewer female than hermaphrodite florets, or homogamous with the florets all hermaphrodite. Involucre-bracts usually scarious.

**HELICHRYSUM.** Flower-heads in corymbs, or rarely solitary, the involucreal bracts almost all or the inner ones or their laminae opaquely scarious or petal-like. Achenes not beaked. Bristles of pappus smooth, rough or minutely bearded, rarely feathery towards the end.

× ✱ Style-branches of hermaphrodite flowers not truncate, filiform. Flower-heads androgynous.

+ Female florets supported or enveloped by the scales of the receptacle or by the involucre-bracts.

**ATHROISMA.** Flower-heads in dense terminal solitary clusters or short spikes. Female florets subtended by the scales of the receptacle. Achenes broad, dorsally compressed, ciliate on the margins. Scales of pappus very short, united into a ciliate-fringed ring. Herbs, the leaves pinnatisect.

+ + Receptacle naked. Involucral bracts herbaceous, or scarious, linear.

† Flower-heads small, packed into dense globose or ovoid clusters.

**SPHERANTHUS.** Flower-heads in solitary terminal globular clusters. Pappus none. Anthers without tails or points at the base.

**PTEROCALON.** Flower-heads sessile, in spiked clusters or rarely solitary. Pappus of capillary bristles. Anthers with short tails or points at the base.

† † Flower-heads separate, solitary, corymbose or panicked, rarely clustered.

• O Pappus of a few rigid bristles or scales, or none.

**EPALPTS.** Involucre-bracts rigid. Anthers with simple tails. Pappus of the female florets none, of the sterile disk-florets small.

O O Pappus consisting of copious capillary soft bristles or hairs.

**BLUMEA.** Flower-heads racemose, spiked or panicked. Style of the disk-florets all 2-cleft. Involucre bracts narrow-linear, herbaceous or thin scarious. Herbs, rarely shrubs.

**PLUCHEA.** Flower-heads corymbose. Some or all of the disk-florets sterile, with a simple style. Involucral bracts rigid, often broad. Shrubs or undershrubs.

O O Anther-base obtuse, or only mucronate or acute, but not tailed.

*Subtrib. 6. ASTEROIDEÆ.* Flower-head heterogamous, radiate or discoid or homogamous in absence of the ray-florets. Involucre-bracts in several or rarely only 2 rows. Anthers with obtuse almost entire base. Style-branches linear, more or less flattened, produced beyond the stigmatic lines into lips or appendages, papillose on the outside. Receptacle usually naked. Leaves usually alternate.

\* Female florets if present filiform or bell-shaped or 2-toothed.

× Female florets if present filiform. Pappus bristly (*Conyzæ*).

**MICROGLOSSA.** Female florets in 1 or several rows with the corollas minutely ligulate, those on the disk fertile. Pappus bristles elongate. Involucre-bracts in many rows. Shrubs.

**CONYZA.** Female florets in many rows with the corollas shortly filiform (rarely slightly and minutely ligulate), the hermaphrodite florets mostly fertile. Achenes compressed. Pappus-bristles elongate. Involucre-bracts in 2 to many rows. Herbs or undershrubs.

**THESPTS.** Female florets in 2 to many rows, destitute of a corolla, the hermaphrodite florets sterile. Pappus-bristles short, somewhat dilated at the base. Herbs.

× × Female florets in 2 or more rows not exceeding the disk, 2-toothed at the apex or bell-shaped. Herbs. (*Grangineæ*).

**CYATHOCLINE.** Receptacle almost contracted around the margin, raised, the disk concave. Achenes not beaked, compressed, bordered with a marginal nerve. Flower-heads panicked.

**GRANDEA.** Receptacle convex or conical, naked. Achenes produced into a ring or neck toothed or almost bristly on the margins. Flower-heads solitary.

**DICHOCEPHALA.** Receptacle almost contracted around the raised margin, the disk almost flat. Style-branches of the disk-florets acute. Achenes not beaked, compressed, bordered by a nerve. Flower-heads racemose or panicked.

\* \* *Female florets if present ligulate.*

- × Ligulate female florets not yellow (white or rose-coloured to purple).
- + Pappus none or very short (*Bellidea*).

**MYRIACTIS.** Involucre broad, the narrow bracts in few rows. Ligules in 2 or more rows, small. Achenes not or very shortly beaked, oily. Pappus none.

**RHYNCHOSPERMUM.** Involucre-bracts in few rows, imbricate. Ligules in 2 or more rows, short and broad. Achenes beaked. Pappus of a few very caducous bristles or none.

- + + Pappus of elongate bristles, rarely short and paleaceous or awned (*Pterochromæ*).

- † Pappus consisting of very short bristles, scales, or awns, or absent in the ray-achenes.

**BOLTONIA.** Receptacle conical or convex. Bristles of pappus very short, almost paleaceous, often accompanied by 2—4 awns not exceeding the achene.

- † † Pappus consisting of copious capillary bristles in a single or more rows (rarely depauperate in the ray-achenes).

- ‡ Ligules usually rather broad or ample.

**CALLISTEPHUS.** Involucre hemispherical, the outer bracts leafy, the inner ones membranously scarious. Achenes compressed. Outer bristles of pappus very short and forming a small crown.

**ASTER.** Involucre bell-shaped or hemispherical, the bracts in many rows, not or leafy appendaged, or squarrose, or with scarious margins, or herbaceous and in only\* 2 rows. Bristles of pappus in several to 2 rows, equal. Achenes usually much compressed. •

- ‡ ‡ Ligules usually numerous, in 2 or more rows, narrow or almost filiform or minute.

**ERIGERON.** Involucral bracts nearly in 2 rows, narrow, somewhat unequal. Achenes compressed. Bristles of pappus in a single row, or with a few very short outer ones.

- × × Ligulate female florets (like the disk-florets) yellow. (*Homochromæ*).

**SOLIDAGO.** Ray-florets few. Involucre narrow, rather wide. Appendage of the style-branches usually lanceolate. Achenes obovoid or oblong. Bristles of pappus capillary, copious, somewhat unequal. Shrubs or undershrubs.

*Subtrib. 7. SENECTIONIDEÆ.* Flower-heads either heterogamous, with the female florets ligulate or rarely filiform, or sometimes homogamous, with all the florets hermaphrodite and tubular. Receptacle usually naked. Involucre-bracts usually in a single row, with or without outer small ones, rarely in several rows and imbricate. Anthers obtuse or shortly 2-mucronate at the base. Style-branches of the hermaphrodites truncate and penicillate, or rarely with pubescent tips or appendages. Pappus of capillary bristles. Leaves alternate.

- \* *Involucre wide, the bracts membranous or herbaceous, elongate or acuminate.*

**DORONICUM.** Flower-heads radiate. Involucre-bracts in 2 rows, equal, herbaceous, acuminate. Receptacle hemispherical. Herbs.

- \* \* *Involucre-bracts narrow, stiff, usually ribbed or keeled.*

- × Flower-heads heterogamous, discoid, the outer female florets filiform, shorter than their style.

• **ERECITHITES.** Involucre etc. of *Senecio*. Female florets in 2 or more rows, the outer ones filiform. Flower-heads usually narrow, corymbose. Herbs.

- × × Flower-heads radiate or homogamous. Bristles of pappus not feathery.

**GYNURA.** Flower-heads homogamous. Style-branches terminating in an elongate shortly hairy subulate appendage. Rest as in *Senecio*. Herbs, often tuberous-rooted.

**EMILIA.** Flower-heads homogamous. Style-branches terminating in a short or rather long appendage. Rest as in *Senecio*. Herbs.

**NORONIA.** Flower-heads homogamous. Style-branches of hermaphrodites terminating in an ovate appendage. Rest as in *Senecio*. Fleshy glaucous herbs.

**SENECIO.** Flower-heads radiate or homogamous. Involucre wide or narrow, the bracts narrow, equal, blunt or shortly pointed, the outer ones small or wanting, or rarely gradually longer from below. Style-branches truncate or obtuse, or rarely shortly appendaged. Achenes 5—10-ribbed. Herbs or rarely shrubs, the leaves alternate or radical.

\* \* *Flower-heads homogamous, all the florets regularly tubular, never yellow (usually purple, violet, or white).*

*Subtrib.* 8. **EUPATORIACEÆ.** Anther-base nearly entire. Style-branches almost terete or very elongate-club-shaped, obtuse, only minutely papillose. Leaves opposite or alternate.

\* *Anthems appendaged at the tip. Achenes 5-ribbed (Agerateæ).*

× Bristles of pappus copious, smooth or minutely hairy.

**EUPATORIUM.** Involucre-bracts in several, rarely in 2—3 rows, somewhat unequal, always more than 5. Flower-heads usually many (rarely 1—4) flowered, corymbose or panicled.

**MIKANIA.** Involucre-bracts 4 only, somewhat unequal. Flower-heads 4 flowered, racemose or panicled. Twining shrubs.

× × Pappus entirely or partially chaffy or awned, or consisting of 5—10 rigid bristles, or minute and coronate, or none.

**AGERATUM.** Involucre-bracts in 2—3 rows, somewhat unequal. Pappus of 5 short scales or long awns free or united into a shagged crown, or of 10—20 stiff bristles chaffy or dilated at the base. Herbs.

\* \* *Anthems truncate at the top and not appendaged. Achenes 5-ribbed.*

**ADENOSTEMMA.** Involucre-bracts numerous, almost in 2 rows, somewhat unequal. Pappus of 3—5 short stiff spreading bristles usually gland-tipped. Herbs.

*Subtrib.* 9. **VERNONIACEÆ.** Anther-base sagittate. Style-branches subulate, shortly hairy all over. Leaves usually alternate.

\* *Flower-heads small, sessile, usually 1- or few-flowered, packed into a head-like cluster. (Lychnophoræ).*

**ELEPHANTOPUS.** Florets slightly irregular, by 2—5 in a head. Involucre-bracts usually 8, in 2 rows. Bristles or scales of pappus rigid, in 1 or 2 rows. Flower-heads clustered, the clusters leafy-involucered. Herbs.

\* \* *Flower-heads separate, usually peduncled and in more or less lax inflorescences. (Vernoniæ).*

× Pappus none or more usually composed of a few very caducous bristles.

**ETHULIA.** Involucre bell-shaped, not leafy. Flower-heads small, corymbose. Achenes 4—5-cornered, broadly truncate at the top. Pappus none. Herbs.

**CENTRATHERUM.** Involucre wide, the outer bracts leafy or rarely only shortly leafy-appendaged. Flower-heads corymbose or solitary. Pappus of a few or numerous bristles. Herbs.

× × Pappus more or less persistent, composed of numerous capillary bristles in 2—3 rows, those of the outer row sometimes very short, or reduced to scalelets.

**VERNONIA.** Flower-heads various, the bracts in many rows, scarious or the outer ones sometimes leafy-appendaged. Receptacle naked or areolate. Achenes 10-ribbed or 4—5-cornered. Outer pappus as long as the inner, or shorter, very short, or none. Shrubs or herbs.

*Trib. II. CYNAROCEPHALÆ*, Vaill. Florets either regular and tubular with the style usually thickened joint-like near or at the apex, or bilabiate with the styles various. Herbs, rarely shrubs, ~~not~~ aromatic. Anther-base usually tailed or fringed.

*Subtrib. 10. CYNAROIDEÆ.* Flower-heads discoid, the florets all tubular and regular or nearly so, hermaphrodite, the lobes usually narrow. Anthers usually fringed or tailed at the base. Style usually thickened joint-like at or below the division into branches, which latter are narrow and obtuse, or slightly pointed and often erect. Leaves alternate, often spiny.

\* *Flower-heads usually many-flowered, separate.*

× Achenes usually glabrous, seated in the very oblique or lateral areoles of the receptacle. (*Centaureæ*.)

+ Involucre without floral leaves or outer leafy bracts.

**TRICHOLEPIS.** Involucre-bracts narrow, awned-acuminate, entire, not appendaged. Filaments shortly papillose-pilose. Anthers with rather long shaggy tails. Style-branches thin. Achenes glabrous, obtusely cornered or compressed. Leaves unarmed.

+ + Involucre surrounded by spiny-toothed floral leaves or outer leafy bracts.

**CARTIUMUS.** Outer involucre bracts with a large leafy appendage, inner ones spiny-pointed. Florets orange. Pappus none, or paleaceous. Achenes compressed or obtusely cornered. Leaves spiny-armed.

× × Achenes usually glabrous, seated in the straight areoles of the receptacle. (*Carduineæ*.)

+ Filaments papillose-pilose, free. Bristles of pappus united at the base into a ring and both deciduous.

**CNICUS.** Outer involucre bracts usually spiny armed, the innermost ones often unarmed. Receptacle densely covered with rigid bristles often longer than the achenes themselves. Bristles of pappus feathery or shortly bearded. Leaves spiny-armed.

+ + Filaments glabrous, free.

**SAUSUREA.** Involucre not prickly. Pappus of numerous feathery bristles in a single row with or without a few simple ones outside. Receptacle with bristles between the florets. Leaves not armed.

\* \* *Flower-heads 1-flowered, packed into dense spherical heads. Achenes inserted in the straight areoles of the receptacle, silky-villous (Echinopsidæ).*

**ECHINOPS.** Leaves and involucre spiny-armed. Thistle-like herbs.

*Subtrib. 11. MUTISLACEÆ.* Flower-heads either heterogamous, with radiating female florets, or homogamous, with the florets all hermaphrodite and tubular, in both cases some or all of the outer florets more or less 2-lipped. Anthers with pointed or tailed base. Style not or slightly thickened joint-like at the apex, the branches very short or elongate, rounded or truncate at the tips, not appendaged. Pappus bristly, paleaceous or rarely absent. Leaves radical or alternate, rarely opposite.

\* *Flower-heads homogamous, the corollas tubular with the segments of limb narrow, equal or almost 2-lipped. (Gochnatium).*

× Flower-heads usually many-flowered.

**DICOMA.** Flower-heads usually almost sessile. Style-branches linear, long or shortened. Achenes densely villous. Scales or bristles of the pappus feathery, copious. Herbs.

× × Flower-heads few-flowered.

**LEUCOMERIS.** Receptacle naked. Style-branches very short, conniving or almost spreading. Achenes oblong, silky-villous. Bristles of pappus smooth. Flower-heads corymbose. Shrubs or small trees.

**AINSLIEA.** Style-branches very short. Bristles of pappus feathery. Flower-heads 2—5-flowered, sessile or peduncled, racemose or panicle. Herbs.

\* \* *Flower-heads usually radiate, the corollas ligulate-2-lipped, rarely ligulate* (Gerberae).

**GERBEA.** Involucre turbinate or bell-shaped, the bracts unequal, imbricate. Ray-florets in 1 or 2 rows, 2-lipped, the ligules 3—4-nerved. Achenes usually beaked. Pappus reddish. Herbs, the leaves radical.

*Subord. II. CICHORIACEÆ, Juss.* Flower-heads homogamous, all the florets ligulate and hermaphrodite. Style not thickened at the apex, the branches filiform, revolute, and puberulous. Herbs, tall or small, never woody, with fistulose stems, the sap always milky.

\* *Pappus paleaceous, awned, coronate or none.*

*Subtrib. 1. HYOSERIDEÆ.* Involucre various. Achenes truncate at the top. Pappus consisting more or less of small scales or scalelets alternating with bristles, or none.

**CICHORIUM.** Inner involucre-bracts in 1—2 rows, almost equal, erect, the outer ones short, lax or wanting. Pappus none or very minute. Florets large, blue. Rigid branched herbs.

\* \* *Bristles of pappus (at least those of the central achenes) capillary, smooth or feathery.*

*Subtrib. 2. CREPIDÆ.* Involucre calyx-like or rarely imbricate. Achenes contracted at the base, rarely columnar. Herbs.

\* *Hairs of indument simple. Innermost bracts of the involucre usually thickening at the base.* (Crepideæ).

**CREPIS.** Involucre of a single row of nearly equal bracts, with a few small outer ones. Achenes not at all or scarcely flattened, very shortly contracted at the top. Pappus sessile, of numerous simple capillary bristles or hairs. Herbs with leafy stems.

**PICRIS.** Outer involucre-bracts small, numerous. Achenes very shortly contracted at the top. Pappus (at least of the central achenes) consisting of feathery bristles. Hispid herbs, with leafy stems.

\* \* *Hairs of indumentum (if present) stellate often accompanied by simple ones, or the indument intricately woolly. Innermost bracts of the involucre not thickening.* (Hieraciceæ).

**HIERACTUM.** Receptacle naked or very shortly fibrillose. Bristles of the pappus rather stiff, fragile, persistent, simple. Herbs.

*Subtrib. 3. LACTUCACEÆ.* Involucre calyx-like or rarely imbricate. Achenes contracted at both ends, or beaked. Bristles of pappus simple. Herbs; the hairs if present simple.

\* *Achenes shortly or long-beaked.*

**LACTUCA.** Achenes more or less compressed, ribbed. Bristles of pappus persistent or deciduous. Florets yellow or blue.

\* \* *Achenes not beaked.*

**PRENANTHES.** Achenes almost terete or somewhat compressed, bluntish 3—5-cornered, not or scarcely ribbed. Bristles of pappus more or less persistent. Florets purple to white, never yellow.

**SONCHUS.** Achenes more or less compressed, ribbed. Bristles of pappus soft, white, at base united into a ring and deciduous with it. Involucral bracts often incrassate-dilated in fruit. Florets yellow.

**MICRORHYNCHUS.** Achenes columnar, truncate at both ends, bluntly 4—5-ribbed, sometimes narrowly 2—3-winged. Florets yellow.

### **Xanthium, L.**

1. **X. STRUMARIUM**, L. sp. pl. 1400 DC. Prod. V. 524; Bth. Fl. Hongk. 181; Clark. Comp. Ind. 132. (*X. Indicum*, Roxb. Fl. Ind. III. 601; DC. Prod. V. 523; Wight Icon. t. 1104; Griff. Not. Dicot. 232; *X. Roxburghii*, Wallr. Beitr. Bot. I. 233; Walp. Rep. VI. 151; *X. discolor*, Wallr. l. c.; Walp. l. c.; *X. brevirostre*, Wallr. l. c.; Walp. l. c.; *X. inaequilaterum*, DC. Prod. V. 523; Wallr. Beitr. Bot. 232; Walp. Rep. VI. 151).

**HAB.** Frequent in rubbishy or waste places, along river-banks, etc., not only in the mixed forests, but more so in and around villages, all over Burma from Chittagong and Ava down to Tenasserim.—Fl. Fr. C. and HS.

### **Tridax, L.**

\*1. **T. PROCUMBENS**, L. sp. pl. ed. 1. 900; DC. Prod. V. 679; Clark. Comp. Ind. 142.

**HAB.** A weed like wild on old walls, in rubbishy places, etc., common about Chittagong; less so about Akyab in Arracan, and in Rangoon, and probably around other seaports, but not yet spread over the country as in India.—Fl. Fr. ∞.

### **Synedrella, Gærtn.**

\*1. **S. NODIFLORA**, Gærtn. Fruct. II. 456. t. 171; DC. Prod. V. 629; Clark. Comp. Ind. 139. (*Verbesina nodiflora*, L. Amoen. IV. 290).

**HAB.** Rubbishy places and neglected garden land in and around villages, rather frequent about Akyab, Arracan; Upper-Tenasserim, Moulmein (Dr. Stoliczka); on the Andamans now very common and penetrating to the clearings in the jungles.—Fl. Oct.—March; Fr. Febr.—May.

### **Cosmos, Cav.**

#### *Conspectus of Species.*

Florets all purple to rose-coloured; achenes long and slenderly beaked, the beak terminated by 2 stiff awn-like bristles, ..... *C. caudatus*.  
 Florets all yellow; achenes long but thickly beaked, the beak without pappus-bristles, .. *C. sulfuratus*.

\*1. *C. CAUDATUS*, H. B. K. Nov. gen. Amer. IV. 240; DC. Prod. V. 606; Griseb. Fl. West. Ind. 373.

HAB. As wild in neglected lands in and around Rangoon.—Fl. Nov., Dec.

\*2. *C. SULFUREUS*, Cav. Icon. I. 56. t. 79; DC. Prod. V. 606; Griseb. Fl. West. Ind. 373. (*Coreopsis artemisiæfolia*, Jacq. Icon. III. t. 595; *B. calva*, Clark. Comp. Ind. 141; *Adenolepis calva*, Schultz. Bip. in Zoll. Cat. 123; Miq. Fl. Ind. Bat. II. 79).

HAB. Not unfrequent in the savannahs, and in rubbishy places near villages, about Akyab in Arracan, and in similar places in Rangoon up the valley as far as Phoungyee.—Fl. Nov.—Feb.

I am not at all sure whether the above synonymy is correct. The same plant (*Adenolepis calva*) has become quite a nuisance about Buitenzorg and other places in Java, entering freely the hill-savannahs.

## Bidens, L.

### Conspectus of Species.

Subg. 1. *Platycarpæa*. Achenes flat and rather broad.

Leaves divided into 3 lanceolate serrate segments, or pinnatifid, ..... *B. tripartita*.

Subg. 2. *Psilocarpæa*. Achenes slender, 4-cornered.

Leaves mostly pinnately 4—3-foliate. Ray-florets white, ..... *B. pilosa*.

Leaves mostly bipinnate. Ray yellow. Slender dry herb, ..... *B. bipinnata*.

1. *B. PILOSA*, L. sp. pl. 1166; DC. Prod. V. 597; Clark. Comp. 141 quoad var. *a* (*B. leucantha*, Willd. sp. pl. III. 1282; DC. Prod. V. 598; *B. Sundaica*, Bl. Bydr. 913; DC. Prod. V. 598).

HAB. Here and there springing up in deserted hill-toungyas and in betel-nut gardens of the Martaban hills east of Tounghoo, at 2—4000 ft. elevation; apparently more frequent in the northern hilly parts. of Ava.—Fl. Fr. Sept.—March.

2. *B. BIPINNATA*, L. sp. pl. 1166; Roxb. Fl. Ind. III. 411; DC. Prod. V. 603; Bth. Fl. Austr. IV. 543. (*B. Wallichii*, DC. Prod. V. 598; *B. pilosa*, var. *β. Wallichii*, Clark. Comp. Ind. 141).

HAB. Tenasserim, Tavoy (Wall.). Fl. July—Oct.

## Siegesbeckia, L.

1. *S. ORIENTALIS*, L. sp. pl. 1269; Roxb. Fl. Ind. II. 432; DC. Prod. V. 495; Bth. Fl. Hongk. 182 and Fl. Austr. IV. 535; Wight Icon. t. 1103; Clark. Comp. Ind. 133. (*S. brachiata*, Roxb. Fl. Ind. III. 432).

HAB. Here and there in deserted toungyas, but more frequent in the drier hill-forests of Martaban, at 2000—7100 ft. elevation; also Ava, Bhamo.—Fr. Jan.—March.

**Enhydra, Lour.**

1. *E. FLUCTUANS*, Lour. Fl. Coch. II. 625 ; DC. Prod. V. 637. (*E. Heloncha*, DC. Prod. V. 637 ; Clark. Comp. Ind. 133 ; *E. paludosa*, DC. l. c. ; Bth. Fl. Austr. IV. 546 ; *E. longifolia*, DC. l. c. ; *Hingtscha repens*, Roxb. Fl. Ind. III. 448).

HAB. Not unfrequent in swamps and swampy grass-lands of the cultivated plains of Pegu and Arracan, and probably all over the country ; also Ava, Bhamo.—Fl. Fr. CS.

**Eclipta, L.**

1. *E. ALBA*, Hassk. Pl. Jav. rar. 528 ; Miq. Fl. Ind. Bat. II. 65 ; Bth. Fl. Hongk. 181 and Fl. Austr. IV. 536 ; Clark. Comp. Ind. 134. (*E. erecta*, L. Mant. 286 ; DC. Prod. V. 490 ; *Verbesina alba*, L. sp. pl. 1272 ; *E. longifolia*, Schrad. ap. DC. Prod. V. 490).

Var. *a. ERECTA*, Miq. Fl. Ind. Bat. II. 65 ; Clark. l. c. ; more or less erect and appressed hispid ; peduncles elongate,  $\frac{3}{4}$ —2 in. long.

Var. *β. PROSTRATA*, Miq. l. c. ; Clark l. c. (*E. prostrata*, L. Mant. 286 ; Roxb. Fl. Ind. III. 438 ; DC. Prod. V. 490 ; *E. parviflora*, Wall. in. DC. l. c. ; *E. thermalis*, Bung. Enum. Pl. Chin. bor. No. 224 ; DC. l. c. ; *E. procumbens*, Michx. Flor. Bor. Amer. II. 129 ; DC. l. c. 491 ; *E. brachypoda*, Mchx. l. c. 130 ; DC. l. c. 491), more or less prostrate, appressed hirsute ; flower-heads shortly peduncled.

Var. *γ. ZIPPELIANA*, Miq. l. c. ; Clark. l. c. (*E. Zippeliana*, Bl. Bydr. 914 ; DC. Prod. V. 490 ; *E. hirsuta*, Bartl. in Linn. XIII. Litt. Ber. 95), erect or spreading, more robust in all parts, spreadingly hirsute ; flower-heads shortly petioled.

HAB. Var. *a.* and *β.* common in waste and in cultivated lands, along roadsides, ruined pagodas, etc., not only in the leaf-shedding forests, but more so in the cultivated plains, all over Burma, from Chittagong and Ava down to Tenassérin ; also on the Andamans (here introduced, but rapidly spreading) ; Var. *γ.* along the banks of the Irawaddi in the Prome District.—Fl. Fr. C. and H. S.

**Wedelia, Jacq.****Conspectus of Species.**

\* Some of the outer involucrel bracts more leaf-like and longer than the others.

Pappus cup-shaped.

Flower-heads on very elongate peduncles, always solitary ; leaves oblong to lanceolate, almost sessile or narrowed into a short petiole, ..... *W. calendulacea*.

Flower-heads rather short-peduncled, usually by pairs or few, axillary, terminal and in the fork of the branchings ; leaves ovate to ovate-lanceolate, slenderly petioled,

... *W. urticifolia*.

\* Outer involucrel-bracts not longer than the inner ones. Pappus none or of 2 or 1 deciduous bristles. Flower-heads longer or shorter peduncled, by 2—3 or few, axillary, terminal, and in the branch-forkings.

Straggling perennial; leaves ovate or broadly ovate-lanceolate, ..... *W. biflora*.  
Erect, coarse annual; leaves lanceolate, ..... *W. asperima*.

1. *W. CALENDULACEA*, Less. Syn. 222, non Rich.; DC. Prod. V. 539; Wight Icon. t. 1107; Bth. Fl. Hongk. 182 and Fl. Austr. IV. 537; Clark. Comp. Ind. 136. (*Verbesina calendulacea*, L. sp. pl. 1272; Roxb. Fl. Ind. III. 440).

HAB. Frequent in the tidal forests and along river-banks as high up as the tidal waves, all along the coast from Chittagong and Arracan down to Tenasserim.—Fl. RS.

2. *W. URTICIFOLIA*, DC. in Wight Contr. 18 and Prod. V. 539; Wight Icon. t. 1106. Bth. Fl. Austr. IV. 538. (*W. biflora*, Clark. Comp. Ind. 137. excl. syn. sub. a.; *Verbesina biflora*, Roxb. Fl. Ind. III. 440, non L.)

HAB. Promo hills (Wall.).—Fl. Fr. Sept., Oct.

3. *W. BIFLORA*, DC. in Wight Contr. 18; Bth. Fl. Austr. IV. 539. (*Verbesina biflora*, L. sp. pl. 1272, non Roxb.; *Wollastonia biflora*, DC. Prod. V. 546; Wight Icon. t. 1108. Bth. Fl. Hongk. 183 excl. syn. ?; *W. scandens*, Clark. Comp. Ind. 136; *Verbesina scandens*, Roxb. Fl. Ind. III. 401; *Wollastonia insularis*, DC. Prod. V. 548; *Wollastonia Horsfieldiana*, Miq. Fl. Ind. Bat. II. 72).

HAB. Frequent in the tidal, and more especially in the beach-forests, all along the coasts from Chittagong down to Tenasserim and the Andamans.—Fl. Fr. ∞.

### **Tithonia**, Desf.

\*1. *T. TAGETIFLORA*, Desf. Ann. Mus. I. 46. t. 4; DC. Prod. V. 584; Bot. Reg. t. 591.

HAB. Upper Tenasserim, Attaran (Dr. Brandis), no doubt only an escape from cultivation.

### **Spilanthes**, L.

#### *Conspectus of Species.*

Prostrate or ascending, branched; flower-heads solitary in the leaf-axils or in the forks of the branches, ..... *S. Acmella*.  
Erect, simple-stemmed; flower-heads panicled, ..... *S. paniculata*.

1. *S. ACMELLA*, L. Syst. Veg. 610; Roxb. Fl. Ind. III. 410; DC. Prod. V. 623; Clark. Comp. Ind. 138 excl. var. δ.

Var. α. *ACMELLA*, Clark. l. c. (*Sp. calva* Wight Icon. t. 1109), achenes marginate, with the borders bristly-rough, usually crowned by 1 or 2 bristles.

Var. β. *CALVA*, Clark. l. c. (*Sp. calva*, DC. in Wight Contr. 19; DC. Prod. V. 625; *S. pseudo-acmella*, L. syst. veg. 610; DC. l. c.), achenes not or scarcely marginate and smooth on the margins; pappus usually obsolete.

Var. γ. *OLERACEA*, Clark. l. c. (*S. oleracea*, Jacq. Hort. Vind. II. t.

135; Roxb. Fl. Ind. III. 410; DC. Prod. V. 524), all parts more robust, the flower-heads more than twice the size and often solitary at the ends of the branchlets.

HAB. Var. *a*. common in waste and rubbishy places in and around villages, on road-sides, fallow fields, and toungyas, along river-banks, etc., not only in all leaf-shedding forests but more so in the cultivated tracts, up to 3000 ft. elevation.—Fl. Fr. C. and HS.

2. *S. PANICULATA*, Wall. Cat. 3186; DC. Prod. V. 625. (*S. acmella* var. *δ. paniculata*, Clark. Comp. Ind. 139).

HAB. Frequent in the mixed forests, and more so as a weed in toungyas, poonzohs, and other cultivated and waste lands in and around villages from Pegu and Martaban down to Upper Tenasserim.—Fl. CS.; Fr. C. and HS.

In my eyes a very distinct species. It is the ein-bee-zat of the Burmese, used for poisoning fish.

### Tagetes, L.

#### Conspectus of Species.

Peduncles elongate and almost cylindrical; involueral bracts plain, ..... *T. patula*.  
Peduncles elongate, much swollen at the apex; involueral bracts almost angular *T. erecta*.

\*1. *T. PATULA*, L. sp. pl. 1249; DC. Prod. V. 643; Sims. Bot. Mag. t. 150; Clark. Comp. Ind. 142.

HAB. Frequently cultivated not only by the Burmese but also by the Karens, and often seen springing up in recently abandoned toungyas.—Fl. CS.

\*2. *T. ERECTA*, L. sp. pl. 1249; Roxb. Fl. Ind. III. 435; DC. Prod. V. 643; Clark. Comp. Ind. 143.

HAB. With the preceding, but less frequently seen.—Fl. CS.

### Chrysanthemum, L.

#### Conspectus of Species.

Subg. 1. *Eu-Chrysanthemum*. Achenes of the ray almost triquetrous, the inner nerve produced at the apex into a tooth. Pappus scarcely any.  
Flower-heads large, on long terminal or almost terminal peduncles; ray yellow,

... *C. coronarium*.

Subg. 2. *Pyrethrum*. Achenes oblong, irregularly 3—5-cornered. Pappus scarcely any.

Flower-heads numerous, on slender peduncles, in terminal corymbs; rays yellow, or in garden varieties variously (purple to white and orange) coloured, .... *C. Indicum*.

\*1. *CH. CORONARIUM*, L. sp. pl. 1254; DC. Prod. VI. 64; Clark. Comp. Ind. 146. (*Ch. Roxburghii*, Desf. Cat. Hort. Par. ed. 3. 170; Bot. Mag. t. 1521; DC. Prod. VI. 64; *Pyrethrum Indicum*, Roxb. Fl. Ind. III. 436; Sims. Bot. Mag. t. 152).

HAB. Much cultivated in native gardens, especially in the drier districts, as Prome; also Ava.—Fl. HS.

\*2. CH. INDICUM, L. sp. pl. 1253; Roxb. Fl. Ind. III. 436; Bot. Reg. t. 1287 and 1502 (fl. plen.); Bot. Mag. t. 2556; Clark. Comp. Ind. 147. (*Pyrethrum Indicum*, Cass. Doct. XLIV. 149, non. Roxb.; DC. Prod. VI. 62; *Chrysanth. tripartitum*, Sweet Fl. Gard. t. 193; *Oh. Chinese*, Sab. in Trans. Hort. Soc. Lond. IV. 330. t. 14; *Pyrethrum Sinense*, DC. Prod. VI. 62, Bot. Mag. t. 327 and 2042; Bot. Reg. t. 4. 445 and 616).

HAB. Ava, Taongdong (Wall.), probably cultivated.

### Artemisia, L.

#### Conspectus of Species.

Sect. 1. *Dracunculus*. Flower-heads heterogamous, the ray-florets in a single row and female, the disk-florets bisexual but sterile by abortion of the ovaries.

More or less glabrous, the lower leaves simple, obovate-oblong, toothed at the apex,

... *A. parviflora*.

Sect. 2. *Abrotanum*. Flower-heads heterogamous, the ray-florets female, the disk-florets hermaphrodite: all fertile.

Leaves once or twice bipinnatifid, the segments rather broad and elongate, more or less greyish or silky-villose beneath; flower-heads in large panicles, ..... *A. vulgaris*.

Leaves twice or thrice bipinnatifid, glabrous, the segments almost filiform, acute; flower-heads rather large, in loose panicles, ..... *A. carvifolia*.

1. *A. PARVIFLORA*, Roxb. Fl. Ind. III. 420; DC. Prod. VI. 100; Clark. Comp. Ind. 159. (*A. glabrata*, Wall. Cat. 413; DC. Prod. VI. 100; Wight Icon. t. 1111).

HAB. Martaban, on the Nattoung hill (Rev. F. Mason); Ava hills east of Bhamo.

2. *A. VULGARIS*, L. sp. pl. 1188; Engl. Bot. t. 978; Roxb. Fl. Ind. III. 420; Fl. Dan. t. VII. t. 1176; Hayne Arzn. Gew. II. 12; DC. Prod. VI. 112; Clark. Comp. Ind. 161. (*A. leptostachya*, DC. Prod. VI. 113).

Var. *α. VULGARIS*, Clark. Comp. Ind. 161, leaves beneath whit tomentose, the segments usually sharply serrate and laciniate; young flower-heads often woolly-villous.

Var. *β. INDICA*, Clark. Comp. 162 (*A. Indica*, Willd. sp. pl. III. 1846; DC. Prod. VI. 114; Wight Icon. t. 1112; *A. dubia*, Wall. Cat. 3307; DC. l. c. 110), leaves usually green or greyish and little pubescent; flower-heads lax and remote, adult nearly glabrous, often on short capillary peduncles.

HAB. Var. *α.* Karenee hills (O'Riley, Rev. F. Mason); Ava, Khakyen hills (J. Anderson); var. *β.* Ava, Khakyen hills, Taong-dong, etc.—Fl. Febr.—March.

3. *A. CARVIFOLIA*, Roxb. Fl. Ind. III. 422, err. typ: *carnifolia*; DC. Prod. VI. 119; Clark. Comp. Ind. 162.

HAB. Prome, banks of the Irrawaddi near Meaday (R. Scott).—Fl. Apr.

### Cotula, L.

1. *C. ANTHEMOIDES*, L. sp. pl. 1256; DC. Prod. VI. 78; Bth. Fl. Hongk. 185; Clark. Comp. 149. (*Pleiogyne anthemoïdes*, C. Kosh in Bot. Ztg. 1843. col. 40; *Pleiogyne cardiosperma*, Edg. in Linn. Trans. XX. 71).

Var. *α*. *GENUINA*, achenes winged.

Var. *β*. *HEMISPHERICA*, (*Machlis hemispherica*, DC. in Deless. Icon. Select. IV. t. 50; and Prod. VI. 140; *Artemisia hemispherica*, Roxb. Fl. Ind. III. 422; *Cotula hemispherica*, Wall. Cat. 3236; Clark. Comp. Ind. 150), achenes not winged.

HAB. Var. *α*. Ava, Irrawaddi valley near Sway-koo; and Khakyen hills east of Bhamo (J. Anderson); var. *β*. rather rare on the banks of the Irrawaddi in Pegu; Ava, Bhamo (J. Anderson).—Fl. Fr. Jan.—March.

### Myriogyne, Less.

1. *M. MINUTA*, Less. in Linn. VI. 219; DC. Prod. VI. 139; Bth. Fl. Hongk. and Fl. Austr. IV. 553 excl. syn. Lour. (*Cotula minuta*, Forst. Prod. 301; *Centipeda minuta*, Bth. ap. Clark. Comp. Ind. 151; *Artemisia sternutatoria*, Roxb. Fl. Ind. III. 423; *Dichrocephala Schmidii*, Wight Icon. t. 1610; *M. Cunninghamii*, DC. Prod. VI. 139; F. Muell. Pl. Vict. t. 41; *Centipeda Cunninghamii*, A. Braun and Aschers. Ind. Hort. Berol. 1867. 6; *Centipeda orbicularis*, Miq. Fl. Ind. Bat. II. 89, non Lour.; *Sphæromorphæa Russeliana*, DC. in Deless. Icon. sel. IV. t. 49; DC. Prod. VI. 140; *Centipeda minima*, A. Braun. and Aschers. in Ind. Hort. Berol. 1867. 6.; *Cotula*, sp., Griff. Not. Dicot. 237 ?).

HAB. Frequent in fields, fallow or under cultivation, in wastes and rubbishy places, river-banks, &c., all over Burma, from Chittagong and Ava down to Tenasserim; Andamans, now frequent on rice-fields (originally introduced).—Fl. Jan.—March; Fr. HS.

### Centipeda, Lour.

1. *C. ORBICULARIS*, Lour. Fl. Coch. II. 602; Clark. Comp. Ind. 151. (*Sphæromorphæa* ? *Centipeda*, DC. Prod. VI. 140).

HAB. Adjoining provinces of Siam, in dried up marshes near Rad-booree (Teysmann).—Fl. HS.

### Inula, L.

#### , *Conspectus of Species.*

× Stems not winged. Villous or villous-pubescent undershrubs.

Bracts of the involucre narrow-linear. Flower-heads corymbose panicled. . . *I. cappa*.

× × Stems leafy-winged from the decurrent sessile leaves. Densely woolly villous tall annuals.

Flower-heads thick, woolly, and rather large, corymbose, the outer involucre-bracts leafy linear-oblong, ..... *I. polygonata*.

1. *I. CAPP*, DC. Prod. V. 469; Bth. Fl. Hongk. 180; Clark. Comp. Ind. 124. (*I. pseudo-Cappa*, DC. l. c. 469; *I. eriophora*, DC. l. c. 470; *I. salviodora*, Schultz. Bip. in Zoll. Cat. 122; Miq. Fl. Ind. Bat. III. 62; *Duhaldea Chinensis*, DC. Prod. V. 366; *I. oblonga*, DC. Prod. V. 469).

HAB. Common in the drier hill-, more especially the pine-forests of Martaban and Upper Tenasserim, up to 4000—5000 ft. elevation, descending into the eng- and hill-eng-forests, where it is not unfrequent; also Ava hills.—Fl. Febr., March; Fr. April, May.

2. *I. POLYGONATA*, DC. Prod. V. 465; Clark. Comp. 119.

HAB. Common in the eng- and hill-eng-forests all over Prome, Pegu, and Martaban, up to 2000 ft. elevation, most probably also in Ava.—Fl. CS.; Fr. HS.

N. B. *I. Oculus-Christi*, Clark. Comp. Ind. 120, has nothing to do with the Linnean plant, and is *I. obtusifolia*, Kerner Nov. sp. pl. II. 18.

#### Vicoa, Cass.

##### Conspectus of Species.

Slender, more or less roughish; leaves short; flower-heads only 2—2½ lin., across, ..... *V. Indica*.  
More robust, more glabrescent; leaves elongate-linear; flower-heads ½—¾ in. in diameter, ..... *V. appendiculata*.

1. *V. INDICA*, DC. Prod. V. 474; Wight Icon. t. 1148; Clark. Comp. Ind. 127. (*Inula Indica*, L. sp. pl. 1237; *V. aurita*, DC. l. c.; *V. auriculata*, DC. l. c.; *Doronicum calcaratum*, Roxb. Fl. Ind. III. 434).

HAB. Frequent in the eng and dry forests of the Prome District.—Fl. Jan.—March; Fr. March, April.

2. *V. APPENDICULATA*, DC. Prod. V. 474; Clark. Comp. Ind. 127.

HAB. Ava, apparently not unfrequent along the Irrawaddi.—Fl. Decb., Jan.º

#### Pulicaria, Gaertn.

1. *P. GLAUDESCENS*, Clark. Comp. Ind. 130, excl. syn., non Bth.

HAB. Tenasserim (or Andamans?) (Helfer 3176).

Evidently no *Pulicaria*, and certainly not identical with the Persian plant. It looks more like *Pluchea*, but the pappus is different. The material at disposal is defective.

#### Cæsulia, Roxb.

1. *C. AXILLARIS*, Roxb. Corom. Pl. I. t. 93 and Fl. Ind. 447; Rot. Rep. t. 431; DC. Prod. V. 482; Wight Icon. t. 1102; Clark. Comp. Ind. 116. (*Meyera orientalis*, Don Prod. Nep. 180).

HAB. Chittagong.

**Anaphalis, DC.***Conspectus of Species.*

Leaves adnate but not decurrent at the base, 1-nerved; flower-heads peduncled, 3—4 lin. in diameter, corymboso; an adnate-lanate herb, ..... *A. Royleana*.

Leaves more or less decurrent at the base, 3-nerved; flower-heads half the size, sessile and clustered, in corymbs; densely white adnate-woolly stout herb, ..... *A. adnata*.

1. *A. ROYLEANA*, DC. Prod. VI. 272; Clark. Comp. Ind. 104.

HAB. Here and there in the hill-toungyas of Martaban east of Tounghoo, at about 4—5000 ft elevation; also Ava hills.—Fl. March.

2. *A. ADNATA*, DC. Prod. VI. 274; Clark. Comp. Ind. 108.

HAB. Frequent in the drier hill-, especially the pine-forests, and on the hill-pastures of the higher ridges of Martaban, from 5400—7100 ft. elevation.—Fl. Nov.—Febr.; Fr. Febr.—March.

**Gnaphalium, L.***Conspectus of Species.*

\* *Flower-heads corymboso, or the corymbs contracted and almost head-like.*

× Leaves linear, with a rounded base half-stem-clasping.

Tall annual; flower-heads laxly corymboso, the involucre bracts yellow or brown,

.. *G. hypoleucum*.

× × Leaves more or less spatulate-linear to cuneate-obovate.

Silky-villous herb much branched from the base; flower-heads densely clustered and forming leafless more or less lax corymbs, the involucre-bracts bright yellow or greyish pale yellow, ..... *G. luteo-album*.

Simple or almost simple tender herb, thinly viscid-pilose; leaves obovate-cuneate, almost half-amplexicaul, thinly herbaceous; flower-heads in dense terminal almost head-like corymbs, the involucre bracts almost membranous, often more or less steel-blue coloured, ..... *G. flaccidum*.

\* \* *Flower-heads clustered or rarely solitary in the axils of the leaves and usually gradually passing into a leafy terminal spike or head.*

Erect or spreading from the base, more or less silky-pilose; leaves elongate obovate-cuneate; flower-heads only about a line long, leafy spicate, ..... *G. Indicum*.

As preceding, but flower-heads about 2 lin. long, the involucre-bracts firmer,

.. *G. purpureum*.

Prostrate and spreading, the branchings only slightly leaved at the lower parts, more so upwards, the upper leaves forming stellate involucre to the densely crowded leafy heads, ..... *G. crispatum*.

1. *G. HYPOLEUCUM*, DC. in Wight Contr. 21 and Prod. VI. 222; Wight Icon. t. 1114; Bth. Fl. Hongk. 187; Clark. Comp. Ind. 114. (*G. confertum*, Bth. in Lond. Journ. Bot. I. 488).

HAB. Frequent in the drier hill-, especially the pine-forests, and freely springing up as well in the clearings as on the hill-pastures, of Martaban, at 4000 to 6000 ft. elevation; also Ava-hills.—Fl. Fr. March.

2. *G. LUTEO-ALBUM*, L. sp. pl. 1198; Engl. Bot. t. 1002; Fl. Dan. t. 1763, DC. Prod. VI. 230; Clark. Comp. Ind. 114. (*G. pallidum*, Lamk.

Dict. II. 750; DC. Prod. VI. 230; *G. confusum*, DC. Prod. VI. 222; *G. multiceps*, Wall. Cat. 8949; DC. Prod. VI. 222; Bth. Fl. Hongk. 188; *G. ramigerum*, DC. Prod. VI. 222; *G. oriense*, Roxb. Fl. Ind. III. 425; *G. Javanicum*, DC. Prod. VI. 222; *G. Reinwardtianum*, Miq. Fl. Ind. Bat. II. 91).

HAB. Common in cultivated lands, along river-banks, in deserted toungyas and open waste places, in all leaf-shedding forests, all over Burma and adjacent islands, up to 4000 ft. elevation.—Fl. Fr. Febr.—May.

3. *G. FLACCIDUM*, Kurz MS.; Clark. Comp. Ind. 115.

HAB. Here and there in light bamboo-jungles (of *Bamb. arundinacea*) in the alluvial lands between the Irrawaddi and Lhein rivers in Pegu.—Fl. Jan.

4. *G. INDICUM*, L. sp. pl. 1200; DC. Prod. VI. 231; Bth. Fl. Austr. IV. 655; Clark. Comp. Ind. 114. (*G. strictum*, Roxb. Fl. Ind. III. 424; *G. multicaule*, Roxb. Fl. Ind. III. 425; *G. Niliacum*, Raddi in Spreng. Syst. veg. III. 480; DC. Prod. VI. 231).

HAB. Common on fallow fields, along river-banks and roads, in waste places near and around villages, etc. of all the cultivated plains, but also in open somewhat moist or temporarily inundated grounds in all the leaf-shedding, especially the mixed forests, all over Burma, down to Tenasserim.—Fl. Fr. Jan.—May.

5. *G. CRISPATULUM*, Del. Fl. Aeg. 123 t. 44. f. 3; DC. Prod. VI. 231; Clark. Comp. Ind. 115. (*G. depressum*, Roxb. Fl. Ind. III. 425; *Filago prostrata*, DC. Prod. VI. 249).

HAB. Not unfrequent in temporarily inundated places, in fallow rice-fields and along river-banks of the alluvium of Pegu and Prome.—Fl. CS.

#### *Athroisma*, DC.

1. *A. LACINIATUM*, DC. Prod. V. 369; Clark. Comp. Ind. 98. (*A. viscidum*, Zoll. and Mor. Cat. 122; Miq. Fl. Ind. Bat. II. 35).

HAB. Frequent in dried up river-beds and other temporarily inundated places and on the banks of the larger rivers, as Sittang, Irrawadi, Lhein, etc., of Pegu, Prome, and Martaban; also Tenasserim (Helf. 3127).—Fl. Fr. Jan.—May.

#### *Pterocaulon*, Ell.

1. *P. BILLARDIERI*, F. Muell. Descript. Not. Papuan Pl. III. 43. (*Monenteles spicatus*, Labill. Sert. Nov. Caled. 43. t. 43; DC. Prod. V. 455; *P. cylindrostachyum*, Clark. Comp. Ind. 99).

HAB. Frequent in fallow fields, in neglected culture-land, along river-banks, all over Prome; Ava, along the Irrawaddi, and on Taongdong.—Fl. Fr. Jan.—March.

**Sphæranthus, L.***Conspectus of Species.*

*Subg. 1. Polycephalos, Forsk.* Outer bracts of the flower-heads longer than the flower-heads themselves, scarious and long-awned.

Glabrous, the branches only slightly winged; heads more oval, sessile, the empty bracts glabrous, ..... *S. amarantoides*.  
 Glandular-puberulous, the branches leafy- and serrate-winged; heads shortly peduncled, the empty bracts appressed bristly and ciliate, ..... *S. Peguensis*.

*Subg. 2. Eu-Sphæranthus.* Bracts shorter than the flower-heads and almost entirely hidden by them. Branches leafy-winged.

Pubescent or hirsute; heads globose  $\frac{1}{2}$ — $\frac{3}{4}$  in. thick, the involucre-bracts tapering into a subulate ciliate point, ..... *S. hirtus*.

Glabrous; heads half the size, the involucre-bracts scarious, often jagged at the ends, .. *S. Indicus*.

1. *S. PEGUENSIS*, Clark. Comp. Ind. 97.

HAB. Frequent on fallow fields and in waste lands of Prome; probably also Ava.—Fl. March.

I have not seen the Ava specimens of *Sph. amarantoides* referred to by DeCandolle, but suspect they belong to the above species.

2. *S. HIETUS*, Willd. sp. pl. III. 2395; Wight Icon. t. 1094; Clark. Comp. Ind. 97. (*S. mollis*, Roxb. Fl. Ind. III. 546; DC. Prod. V. 369).

HAB. Common in fallow fields, in cultivated or deserted toungyas, along river-banks and similar places, all over Burma, from Chittagong down to Tenasserim.—Fl. November to April; Fr. April, May.

3. *S. INDICUS*, L. Fl. Zeyl. 312; Roxb. Fl. Ind. III. 446. (*S. microcephalus*, Willd. sp. pl. III. 2395; DC. Prod. V. 369; Bth. Fl. Austr. IV. 522; Clark. Comp. Ind. 97).

HAB. Prome district; Upper Tenasserim, Moulmein.—Fl. Sept.—Apr.; Fr. C. and HS.

**Epaltes, Cass.**

1. *E. DIVARICATA*, Cass. Bull. philom. 1818. 139; DC. Prod. V. 461; Clark. Comp. Ind. 96. (*Ethulia divaricata*, L. Mant. 110; Burm. Fl. Ind. 176. t. 58. f. 1; (*E. linearifolia*, DC. l. c.; *E. pygmaea*, DC. l. c.).

HAB. Prome hills (Wall).—Fl. Sept., Octob.

**Blumea, DC.***Conspectus of Species.*

\* *Cauline leaves not decurrent on the branches. Florets golden to pale yellow, (except in the white or blue-flowered B. Wightiana). (Apteræ, DC.)*

× Flower-heads on long peduncles arising singly from the axils of the leaves, or rarely appearing compound from the reduction of the leaves.

Shrubby annual; leaves small, sessile with broad base and almost half-stem-clasping; involucre-bracts narrowed into filiform tails; peduncles almost glabrous,

... *B. amplexans*.

Low perennial, branched and ascending from the base, thinly pubescent; peduncles spreadingly pubescent; involucre-bracts very acute; leaves rather large, sessile with a rounded base, ..... *B. bifoliata*.

× × Flower-heads in panicles, racemes, or rarely densely packed into shorter or longer spikes.

+ Serratures or teeth of the leaves spiny indurated at their tips.

Spreading perennial, branched from the base and procumbent, sparingly pilose; leaves small, the serratures few and coarse; flower-heads few, forming irregular depauperate panicles, ..... *B. oxyodonta*.

Erect, simple or branched annual, more or less appressed silky-pilose; leaves rather large, doubled-spiny-serrulate; flower-heads in regular panicles, .... *B. spinulosa*.

+ + Serratures or teeth of the leaves various, but never spiny-indurated.

† Herbs, or biennials, simple or branched from the base, and more or less villous, pubescent, or viscid-puberulous, rarely almost glabrous.

○ Flower-heads irregularly disposed and more or less peduncled, forming panicles or rarely the panicle contracted.

△ Receptacle glabrous.

‡ Florets blue to violet, rarely bluish white.

Tall herb, reduced and small, more or less viscid-pubescent; leaves simple and petioled; flower-heads only 2 lin. long, on shorter or longer filiform peduncles, forming lax panicles, ..... *B. Wightiana*.

‡ ‡ Florets all yellow. Flower-heads in lax panicles. Peduncles slender, although sometimes very short. Annuals, rarely becoming biennials.

Erect, branched from the base, more or less silky-villous, but not viscid, the cauline leaves simple and sessile or nearly so; flower-heads 3—3½ lin. long, in panicles sometimes pretty contracted but elongate, ..... *B. lacera*.

Erect, branchy, thinly viscid-pubescent, the cauline leaves simple and petioled; flower-heads about 4 lin. long, on long slender glandular peduncles, forming lax panicles, ..... *B. glandulosa*.

Erect, branchy, thinly puberulous, the cauline leaves (except in starved states) almost runcinate and petioled; flower-heads about 3 lin. long with the involucre-bracts green and glabrous, on spreading stiff capillary glabrous or glandular peduncles, in lax panicles, ..... *B. diffusa*.

Erect, simple or branched, almost glabrous or usually more or less hirsute, the cauline leaves (especially the lower ones) more or less runcinate; flower-heads nearly 4 lin. long, with the involucre-bracts and the long slender peduncles pubescent, in lax panicles, ..... *B. lactucafolia*.

△ △ Receptacle hairy. Peduncles slender.

Branched or simple annual, shortly or rarely glandular-pubescent, the cauline leaves usually runcinate; flower-heads about 3½ lin. long, longer or shorter peduncled, forming lax leafless panicles, ..... *B. laciniata*.

O O Flower-heads clustered in the axils of the upper leaves and passing more or less gradually into a contracted spike-like panicle, or crowded in a dense terminal spike, or the sessile clusters remote and in simple or paniced slender spikes.

Δ Receptacle hairy. Flower-heads sessile, clustered, or rarely solitary simple or paniced spikes.

Erect, simple or branched annual, slightly or rarely densely pubescent or pilose, the cauline leaves narrow and simple; flower-heads about 3 lin. long, often pilose or almost woolly, ..... *B. fistulosa*.

Δ Δ Receptacle glabrous. Flower-heads more or less peduncled to almost sessile, clustered in the leaf-axils and forming leafy or leafless contracted spike-like panicles or spikes (rarely the panicle developed).

Erect slender annual, long silky-pilose, the leaves all cuneate-oblong to linear; flower-heads silky-pilose, nearly 4 lin. long, on longer or shorter slender peduncles or almost sessile, clustered in the upper leaf-axils and passing into a leafy spike-like contracted panicle, ..... *B. barbata*.

Erect robust annual, villous to silky pubescent, the lower stem-leaves more or less spatulate-oblong or linear; flower-heads  $\frac{1}{2}$ — $\frac{1}{2}$  in. long, on short, thick, woolly-tomentose peduncles or almost sessile, forming dense spikes or spike-like (rarely lax) panicles often accompanied by clusters of flower-heads in the upper leaf-axils, ..... *B. hieracifolia*.

† † Erect or scandent shrubs or under-shrubs, or tall shrub-like biennials.

O Erect.

Δ Peduncles thick and short, densely tomentose. Leaves more or less villous or tomentose, especially beneath. Receptacle more or less hairy.

Leaves pubescent, especially beneath, decurrent and entire at the base; flower-heads 4 lin. long, the involucre bracts narrow, almost glabrous; pappus rufescent; receptacle shortly pilose, ..... *B. macrophylla*.

As preceding, but flower-heads larger, the involucre bracts densely pubescent, pappus white, ..... *B. procera*.

Leaves silky to silvery villous beneath, with one or two pairs of small dissevered pinnæ on the petiole; flower-heads 4 lin. long, the involucre bracts densely pubescent; pappus rufescent; receptacle almost glabrous, ..... *B. balsamifera*.

Δ Δ Peduncles long and slender, puberulous to glandular-pubescent. Leaves narrow.

Glandular-pubescent, especially the leaves beneath, the cauline leaves all sessile, membranous; flower-heads 4—5 lin. long; receptacle glabrous, ..... *B. aromatica*.

Almost glabrous, or the thick almost coriaceous leaves beneath shortly hirsute, the lower cauline leaves long-petioled; flower-heads 4—5 lin. long; receptacle densely silky pilose to glabrous, ..... *B. sessilifolia*.

O O Scandent shrub. Leaves almost coriaceous, simple.

Almost glabrous; flower-heads 5 lin. long, in small axillary corymbs transforming into terminal pubescent panicles; receptacle villous; pappus white, ..... *B. riparia*.

\* \* Cauline leaves decurrent and forming entire or interrupted-lacinate leafy wings.

*Flower-heads long peduncled. Florets purple or rose-coloured (Cauloptoraæ, DC.)*

× Leafy cauline wings cut or variously interrupted.

Leaves pinnatifid-auricled at the base, ..... *B. aurita*.

Leaves entire at the base, ..... *B. pterodonta*.

× × Leafy cauline wings all entire and continuous, ..... *B. alata*.

1. *B. AMPLECTENS*, DC. in Wight Contr. Ind. Bot. 13 and Prod. V. 433; Clark. Comp. Ind. 71. (*B. arenaria*, DC. Prod. V. 433?; *B. tenella*, DC. l. c.; Miq. Fl. Ind. Bat. II. 40; *Conyza amplexicaulis*, Lamk. Diet. II. 85; *Erigeron obliquum*, L. Mant. 572?).

HAB. In rubbishy places near Chittagong; Andamans, introduced.—Fl. Fr. March, April.

2. *B. BIFOLIATA*, DC. Prod. V. 434; Clark. Comp. Ind. 72. (*Conyza bifoliolata*, Willd. sp. pl. III. 1920; Roxb. Fl. Ind. III. 430; *B. anagallidifolia*, DC. Prod. V. 433; *Bl. oligocephala*, DC. Prod. V. 434; *Conyza oligocephala*, Miq. Fl. Ind. Bot. II. 41?; *Conyza humifusa*, Miq. Fl. Ind. Bat. II. 41).

HAB. Chittagong, in pastures and along roads; Pegu (Belanger).—Fl. Febr., March; Fr. April.

3. *B. OXYDONTA*, DC. in Wight Contr. 15 and Prod. V. 444; Clark. Comp. Ind. 85. (*Conyza spinidens*, Miq. Fl. Ind. Bat. II. 44 excl. syn.?)

HAB. Not unfrequent in dry sandy pasture-land, in waste places around and in villages, also river-banks of the Sittang and Irrawaddi delta of Pegu.—Fl. Fr. April—June.

4. *B. SPINELLOSA*, DC. Prod. V. 433?; Clark. Comp. Ind. 84.

HAB. Prome (Wall.).

De Candolle's *B. spinellosa* seems to be a spiny-toothed form of the silvery silk-hairy form of *B. hieracifolia*; Clarke's is near *B. lacera* (with slender peduncles), or near *B. barbata*?

5. *B. WIGHTIANA*, DC. in Wight Contr. 14 and Prod. V. 435; Clark. Comp. Ind. 74. (*B. parvifolia*, DC. Prod. V. 437?; *B. triticiophora*, DC. l. c. 436 teste Clark.; *B. hymenophylla*, DC. Prod. V. 440; *B. lacera* *B. hymenophylla*, Clark. Comp. Ind. 77).

HAB. Common in all mixed forests, especially along choungs, freely springing up in agrarian and waste lands, all over Burma, from Chittagong and Ava down to Tenasserim; also Andamans, here introduced and now spreading.—Fl. Fr. DS.

The colour of the florets and the much smaller size of the flower-heads combined with a viscid pubescence ought to remove all difficulties in distinguishing this species from *B. lacera*, with which Benthams and Thwaites are inclined to combine it. *B. hymenophylla* has pale blue or white florets and is certainly nothing but a slender shade-form which I found in all transitional states in company with *B. Wightiana* (not *B. lacera*, as Clarke states).

6. *B. LACERA*, DC. Prod. V. 436; Clark. Comp. Ind. 79 quoad var. *a.* (*Conyza lacera*, Roxb. Fl. Ind. III. 428).

HAB. Arracan, waste places near Akyab; no doubt to be found all over Burma and only overlooked.

7. *B. GLANDULOSA*, DC. Prod. V. 438; Bth. Fl. Hongk. 177. (*B. lacera*,  $\beta$ . *Heyneana* and  $\gamma$ . *glandulosa*, Clark. Comp. Ind. 78; *B. Heyneana*, DC. Prod. V. 441; *B. cernua*, DC. Prod. V. 436. *teste* Clarke).

HAB. Chittagong.

8. *B. DIFFUSA*, (*Conyza diffusa*, Roxb. Fl. Ind. III. 429; *B. virens*, DC. in Wight Contr. 14 and Prod. V. 439; Clark. Comp. Ind. 79; *B. lapsanoides*, DC. Prod. V. 440).

HAB. Frequent in the leaf-shedding forests, especially the mixed ones, all over Burma, from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. Fr. C. and HS.

9. *B. LACTUCIFOLIA*, DC. Prod. V. 435; Clark. Comp. Ind. 76. (*B. lacera* var.  $\epsilon$ . *subcapitata*, Clark. Comp. Ind. 77. excl. syn. DC.).

Var.  $\beta$ . *SUBSIMPLEX* (*B. subsimplex*, DC. Prod. V. 441; Clark. Comp. Ind. 80; *B. paucifolia*, DC. Prod. V. 440; *A. cuneifolia*, DC. Prod. V. 441, *teste* Clarke), more glabrous and almost simple, the leaves obovate-cuneate and not lobed, but often passing into the runcinate form.

Var.  $\gamma$ . *VISCOSULA*, Clark. Comp. Ind. 80 sub *B. virens*, excl. syn. DC., densely and shortly glandular-pubescent, the leaves small and rather rigidly runcinate.

Var.  $\delta$ . *NUDIPES*, more hirsute instead of pubescent; panicles more squarrose; stem usually naked and destitute of leaves to  $\frac{1}{4}$ — $\frac{1}{2}$  ft. from the ground.

HAB. Frequent in waste and cultivated lands, along river-banks, on walls, in and around villages, etc., all over Pegu and Martaban, and no doubt generally over Burmah; var.  $\beta$ . with the normal form and only a reduced state of it; var.  $\gamma$ . common in waste lands, on old pagodas and walls, etc. all over Pegu and Martaban down to Upper Tenasserim; var.  $\delta$ . frequent in the upper mixed forests of the Pegu Yomah, but rare in those, and in the eng-forests of Martaban east of Tounghoo.—Fl. Fr. C. and HS.

Mr. Clarke refers var.  $\delta$ . to his *B. fasciculata*, but the long peduncled flower-heads and indeed the whole inflorescence are entirely different.

10. *B. LACINIATA*, DC. Prod. V. 436. (*Conyza laciniata*, Roxb. Fl. Ind. III. 427; *B. runcinata*, DC. Prod. V. 438; Clark. Comp. Ind. 78; *B. sonchifolia*, DC. Prod. V. 438; *B. cinerascens*, DC. l. c., *teste* Clarke).

HAB. Prome, Meaday (R. Scott).—Fr. April.

11. *B. FISTULOSA*, (*Conyza fistulosa*, Roxb. Fl. Ind. III. 429; *B. fasciculata*, DC. Prod. V. 442; Clark. Comp. Ind. 81).

Var. *a.* *FASCICULATA*, Clark. Comp. Ind. 82 (*B. fasciculata*, DC. l. c.;

*B. fistulosa*, Roxb. l. c.), spikes more or less paniced; receptacle tawny velvety, the velvet sometimes intermixed with a few white soft hairs.

Var.  $\beta$ . *RACEMOSA*, Clark. l. c. (*B. racemosa*, DC. Prod. V. 442), spikes almost simple or little branched; receptacles yellowish velvety.

Var.  $\gamma$ . *GLOMERATA*, Clark. l. c. (*B. glomerata*, DC. Prod. V. 443 *Conyza Burmeana*, Miq. Fl. Ind. Bat. II. 41), spikes more or less paniced; receptacles velvety, the velvet intermixed with copious soft white hairs.

Var.  $\delta$ . *HOLOSERICEA*, Clark. l. c. (*B. holosericea*, DC. Prod. V. 442), more simple, thinly silky pilose, the spikes usually simple, rarely with a few additional basal ones, long-silky-pilose; receptacle shortly white pilose.

HAB. Var.  $\alpha$ ,  $\beta$ , and  $\gamma$ , equally common in all deciduous forests, especially the drier ones, on ruined pagodas and walls, in rubbishy places, along river-banks, etc.; and as a troublesome weed in deserted toungyas, especially in those of the hills, all over Burma, from Chittagong and Ava down to Tenasserim, up to 4,000 ft. elevation; var.  $\delta$ . is a laterite form pretty frequent in the eng-and hill-eng forests of Martaban and Tenasserim, but rather rare in the upper dry forests of the Prome Yomah, up to 3,000 ft. elevation.—Fl. Fr. C. and HS.

The above varieties are, with the exception of  $\delta$ , hardly worth keeping up. Benthams (Fl. Hongk. and Fl. Austr. IV. 526) refers *B. holosericea* DC. to his *B. hieracifolia*, but a scrap of Wallich's authentic specimens shews small sessile heads, indeed represents the upper part of the form correctly referred by Mr. Clarke to the above species. A Hongkong specimen named *B. holosericea* by Dr. Hance—I suppose on Benthams authority—seems to belong either to the silvery-silky form of *B. lacera* or to *B. hieracifolia* (the flower-heads are too young).

12. *B. BARBATA*, DC. Prod. V. 434; Clark. Comp. Ind. 73.

Var.  $\alpha$ . *GENUINA*, leaves broader or narrower; flower-heads on slender or short peduncles in a diffuse usually long-pilose panicle, or the panicle reduced and raceme-like but laxly contracted.

Var.  $\beta$ . *SERICANS*, leaves more elongate-cuneate to almost linear, appressed silvery pubescent like in *B. lacera*; flower-heads larger, almost sessile or thickly peduncled, clustered in the axils of the leaves and gradually passing into terminal dense spikes.

HAB. Var.  $\alpha$ . Upper Tenasserim, Moulmein (Falconer); var.  $\beta$ . in the upper mixed forests, rare along the Zamayee choung in the Pegu Yomah, but more frequent in those along the Toukyeghat river, in Martaban east of Tounghoo.—Fl. Febr., March; Fr. March, April.

13. *B. HIERACIFOLIA*, DC. Prod. V. 442; Wight Icon. t. 1099; Clark. Comp. Ind. 82.

Var.  $\alpha$ . *TYPICA*, Clarke l. c. 83 (incl. his var.  $\delta$ . *Hamiltonii* (*B. Hamiltonii*, DC. Prod. V. 439), little or not branched except from the base;

flower-heads clustered, forming dense terminal spikes. Radical leaves chiefly developed.

Var.  $\beta$ . EVOLUTION, Clark. l. c. 83, panicles more or less branched, larger or smaller; radical leaves none or marcescent.

HAB. Var.  $\alpha$ . Tenasserim, Mergui (Wall.), a smaller form; var.  $\beta$ . Ava hills.

A species apparently very variable as to inflorescence and habit, the panicked form approaching *B. crinita* and *B. flexuosa* (if these be really distinct from one another), while the subscapiferous forms look somewhat like *Gnaphalium*. *B. lacera*, var.  $\epsilon$ . *subcapitata*, Clark. (*B. subcapitata*, DC. Prod. V. 439), is in my eyes the same as Clarke's var.  $\gamma$ . *Nilagirica* of this species.

14. *B. MACROPHYLLA*, DC. Prod. V. 446; Clark. Comp. Ind. 88. (*Conyza macrophylla*, Bl. Bydr. 896; *B. procera*, DC. Prod. V. 445; Clark. Comp. Ind. 86; *B. semivestita*, DC. Prod. V. 445).

Var.  $\beta$ . PROCERA (*B. procera*, DC. Prod. V. 445; Clark. Comp. Ind. 86; *B. semivestita*, DC. l. c.), flower-heads larger; involucre bracts densely pubescent; pappus white.

HAB. Var.  $\beta$ . not unfrequent in the pine-forests of the Martaban hills, at 3—5000 ft. elevation, descending into the damp hill-forests and becoming more robust and large-leaved (*B. macrophylla*); also Ava, Khakyen hills (J. Anderson).—Fl. March, April; Fr. April.

15. *B. BALSAMIFERA*, DC. Prod. V. 447; Clark. Comp. Ind. 89, (*Conyza balsamifera*, L. sp. pl. 1208; Roxb. Fl. Ind. III. 427; *B. densiflora*, DC. Prod. V. 446; Clark. Comp. Ind. 88; *B. excisa*, DC. Prod. V. 446; *B. grandis*, DC. Prod. V. 447?; *Inula oblonga* var.  $\alpha$ . DC. Prod. V. 4 quoad specim. e Taong-dong).

HAB. Common and freely springing up in and often exclusively covering deserted toungyas, but also in savannahs, along river-banks, etc., all over Burma, from Chittagong and Ava down to Tenasserim, up to 3,000 ft. elevation.—Fl. Fr. HS.

16. *B. AROMATICA*, DC. Prod. V. 446; Clark. Comp. Ind. 88.

HAB. Tenasserim.

Looks like a grandular-pubescent form of *B. sessilifolia*, DC.

17. *B. SESSILIFOLIA*, DC. Prod. V. 447. (*Conyza sessilifolia*, Bl. Bydr. 897; *B. myriocephala*, DC. Prod. V. 445; *B. squarrosa*, Clark. Comp. Ind. 87).

Var.  $\alpha$ . GENUINA, receptacle more or less densely pilose; leaves beneath and involucre bracts often more hairy.

Var.  $\beta$ . LANCEOLARIA (*Conyza lanceolaria*, Roxb. Fl. Ind. VII. 432; *B. longifolia*, DC. Prod. V. 446; *B. Wallichii*, Clark. Comp. Ind. 87, excl. syn. plur.; *Conyza nitida*, Miq. Fl. Ind. Bat. II. 55. teste Clarke), receptacle glabrous, or in forms sparingly pilose.

HAB. Both varieties frequent along choungs in the tropical forests, and also often seen in the hill-toungyas, of Martaban and the Andamans; Upper Tenasserim; Ava, Khakyen hills.—Fl. Febr., March.

Nicobar specimens, and indeed Blume's *Conyza sessilifolia* itself, have the receptacle glabrous or sparingly silky piloso, and thus invalidate this artificial character.

18. B. RIPARIA, DC. Prod. V. 444; Clark. Comp. Ind. 85. (*Conyza riparia*, Bl. Bydr. 899, non Kth).

HAB. Forests of South Andaman.—Fl. March.

19. B. ALATA, DC. Prod. V. 448; Wight Icon. t. 1101; Bth. Fl. Hongk. 177. (*Conyza alata*, Roxb. Fl. Ind. III. 430; *B. vernonioides*, DC. Prod. V. 447; *Conyza nutans*, Bl. Bydr. 896; Miq. Fl. Ind. Bat. II. 57; *Laggera alata*, Bth.; Clark. Comp. Ind. 91).

HAB. In the drier hill-forests, and in hill toungyas, of the Martaban hills east of Tounghoo; Karenee hills (Revd. Mason).

20. B. PTERODONTA, DC. in Wight Contr. 15 and Prod. V. 448; Wight Icon. t. 1100. (*Laggera pterodonta*, Bth.; Clark. Comp. Ind. 92).

HAB. Frequent in toungyas and poonzohs, chiefly of the hilly parts, of Pegu, Martaban, and Upper Tenasserim; also not unfrequently seen in the drier hill-forests, and ascending up to 6000 ft. elevation; Ava, Khakyen-hills; Chittagong.—Fl. Fr. March, April.

21. B. AURITA, DC. Prod. V. 449. (*Conyza aurita*, Roxb. Fl. Ind. III. 428; *Laggera aurita*, Bth.; Clark. Comp. Ind. 92).

HAB. Here and there springing up in toungyas of Pegu and Martaban; more frequent along the Irrawadi in Prome; Ava (Griff. 3164).—Fl. Fr. March, April.

### Doubtful Species.

1. *B. napifolia*, DC. Prod. V. 440.—Tavoy (Wall.).

2. *B. membranacea*, DC. Prod. V. 440.—Prome (Wall.).

3. *B. viscosula*, DC. Prod. V. 441, non Clark.—Taong-dong (Wall.).

### Pluchea, Cass.

#### Conspectus of Species.

*Annuals, glabrous. Florets intensely yellow. Corymbs irregular, small.*

Erect, simple or branched, the cauline leaves sessile with broad rounded base; flower-heads about 2½ lin. long, on rather short smooth peduncles, ..... *P. Doniana*.

*Shrubs or undershrubs. Florets purple to lilac. Corymbs dense, terminal.*

(Receptacle glabrous).

Leaves obovate, blunt or acute; flower-heads 22½ lin. long, the bracts shortly pubescent, bluish to acute; shrub, ..... *P. Indica*.

Leaves linear, glandular-pubescent, acuminate; flower-heads as in preceding, but the inner bracts more acuminate, ..... *P. eupatorioides*.

1. *P. DONIANA*, (*Erigeron falcatum*, Don. Prod. Fl. Nep. 172; *B. flava*, DC. Prod. V. 439; *B. senecioides*, DC. Prod. V. 439; *Laggera flava*, Bth.; Clark. Comp. Ind. 90; *Conyza repanda*, Roxb. Fl. Ind. III. 431, teste Clarke).

HAB. Common in all leaf-shedding forests, more especially in the eng-forests, where it is often reduced to a mere pygmy; all over Burma, from Chittagong and Ava down to Tenasserim.—Fl. Fr. C. and HS.

I place this species only reluctantly in *Pluchea*. But I cannot find any ally to it in *Blumea*, while here it has a very near one in *P. linearifolia*.

2. *P. INDICA*, Less. in Linn. 1831. 150; DC. Prod. V. 451; Wight Illustr. t. 131 (flowers wrongly coloured yellow); Clark. Comp. Ind. 93 (*Baccharis Indica*, L. sp. pl. 1205; *Conyza corymbosa*, Roxb. Fl. Ind. III. 426; *P. foliolosa*, DC. Prod. V. 451?; Clark. Comp. Ind. 95?).

HAB. Frequent in the beach- and tidal forests, entering also the tidal savannahs; all along the coasts, from Chittagong down to Tenasserim and the Andamans.—Fl. CS.; Fr. HS.

3. *P. EUPATORIODES*, Kurz For. Fl. II. 575.

HAB. Adjoining Siamese province of Radbooree (Teysmann).—Fl. Fr. April, May.

N. B. *Laggera arida*, Clark. Comp. Ind. 92 = *Pluchea frutescens*, Bth. in Hook. Icon. pl. t. 1157.

### Microglossa, DC.

1. *M. VOLUBILIS*, DC. Prod. V. 320; Clark. Comp. Ind. 57. (*Sonchus volubilis*, Rumph. Herb. Amb. V. t. 104. f. 1.; *Conyza pyrifolia*, Lamk. Diet. II. 89; *Conyza prolifera*, Bl. Bydr. 897; *Erigeron pyrifolius*, Bth. Fl. Hongk. 176).

HAB. Frequent in grass-jungles and old deserted toungyas all over Martaban and Tenasserim, up to 3500 ft. elevation; Ava, Khakyen hills.—Fl. Febr.; Fr. March.

### Conyza, Less.

#### Conspectus of Species.

\* Flower-heads very small, not above a line long, very numerous, corymbose.

Erect branched annual, shortly pubescent, the leaves small, simple or 3-cleft; pappus more or less rufescent, ..... *C. pinnatifida*.

\* \* Flower-heads 2—4 lin. long.

× Pubescent not viscid nor glandular; leaves serrate to almost lobed, cuneate at base.

Erect, more or less branched annual, more or less hirsute; flower-heads spherical, corymbose; pappus white, ..... *C. semipinnatifida*.

Erect, simple or more usually branched from the base, hirsute or pubescent; flower-heads not spherical, in dense terminal corymbs or clusters; pappus rufescent,

... *C. veronicæfolia*.

× × Glandular, otherwise almost glabrous; leaves almost entire, narrow.

Erect, branched; flower-heads 2—2½ lin. long, on glandular puberulous peduncles, corymbose; pappus pinkish to pinkish white, ..... *B. viscidula*.

1. *C. PINNATIFIDA*, Roxb. Fl. Ind. III. 430. (*C. absinthifolia*, DC. Prod. V. 383; Clark. Comp. Ind. 64).

HAB. Frequent in the drier hill-forests and more so in deserted and cultivated toungyas and open waste places, etc., of the Martaban hills, at 2—5000 ft. elevation; Ava, Khakyen hills.—Fl. Fr. Febr.—April.

2. *C. SEMIPINNATIFIDA*, Wall. Cat. 3058; DC. Prod. V. 382; Clark. Comp. Ind. 62.

HAB. Frequent along the banks of the larger rivers, such as the Irrawaddy and Sittang, from Prome and Martaban southwards.—Fl. Fr. HS.

3. *C. VERONICÆFOLIA*, Wall. Cat. 3005; DC. Prod. V. 382; Bth. Fl. Hongk. 176; Clark. Comp. Ind. 62. (*C. Japonica*, Less. Syn. 204; DC. Prod. V. 382).

HAB. Martaban, Nattoung, in the pine-forests. at about 7000 ft. elevation.—Fl. March.

4. *C. VISCIDULA*, Wall. Cat. 3006; DC. Prod. V. 383; Bth. Fl. Austr. IV. 496; Clark. Comp. Ind. 63. (*C. striata*, Wall. Cat. 3065; DC. Prod. V. 383; *C. Wallichii*, DC. l. c. 384 ex part.; *C. polycephala*, Edg. in Linn. Trans. XX. 66; Walp. Rep. VI. 720).

HAB. Common in toungyas and in open grassy spots, as well in the drier hill-forests of Martaban, up to 6000 ft. elevation, as in the Pegu and Prome Yomah, here descending as low as to 3—400 ft. elevation; also Tenasserim.—Fl. Fr. Jan.—March.

#### Thespis, DC.

1. *TH. DIVARICATA*, DC. Prod. V. 375; Clark. Comp. Ind. 65. (*Th. erecta*, DC. Prod. V. 375).

HAB. Rather frequent along the banks of the larger rivers, as along the Sittang and Irrawaddy in Pegu; Chittagong, on the banks of the Megna.—Fl. May, June; Fr. RS.

#### Cyathocline, Cass.

1. *C. LYRATA*, Cass. in Ann. d. sc. nat. 1829. 34; DC. Prod. V. 374; Wight Icon. t. 1098; Clark. Comp. Ind. 37 (*Artemisia hirsuta*, Rottl. in Spreng. Syst. III. 490; *C. stricta*, DC. Prod. V. 374).

HAB. Common on rock-walls and mossy boulders, etc. in the choungs and torrents all over Burma, from Chittagong and Ava down to Pegu and Arracan.—Fl. Fr. CS.

**Grangea, Ad.**

1. *G. MADERASPATANA*, Poir. Dict. Suppl. III. 825 ; DC. Prod. V. 373 ; Wight Icon. t. 1097 ; Clark. Comp. Ind. 37. (*Artemisia Maderaspatana*, Roxb. Fl. Ind. III. 412).

HAB. A common weed in fallow agrarian lands, along the banks of rivers, waste places in and around villages, etc., all over Burma, down to Tenasserim.—Fl. C. and HS. ; Fr. HS.

**Myriactis, Less.**

1. *M. WALLICHII*, Less. in Linn. 1831. 127 ; DC. Prod. V. 309 ; Clark. Comp. Ind. 38.

HAB. Martaban, in open grassy places and along the outskirts of the hill-forests on Nattoung, at about 6—7000 ft. elevation.—Fr. CS.

**Rhynchospermum, Rwdt.**

1. *R. VERTICILLATUM*, Rwdt. in Bl. Bydr. 902 ; DC. Prod. V. 296 ; Miq. Fl. Ind. Bat. II. 32 ; Clark. Comp. Ind. 39. (*Leptocoma racemosa*, Less. and NE. in Linn. 1831. 130 ; DC. Prod. V. 280 ; *Zollingeria scandens*, Schultz. Bip. in Reg. Flor. 1854. 274 ; Walp. Ann. V. 250.)

HAB. Ava, hills east of Bhamo (J. Anderson).—Fr. September.

**Boltonia, L'Her.**

1. *B. INDICA*, Bth. Fl. Hongk. 174 ; Clark. Comp. Ind. 40. (*Aster Indicus*, L. sp. pl. 1230 ; Burm. Fl. Ind. 181 ; *Asteromoea Indica*, Bl. Bydr. 901 ; DC. Prod. V. 303 ; *Calimeris integrifolia*, DC. Prod. V. 259, teste Clarke ; *Callistemma Indicum*, G. Don in Lond. Hort. Brit. t. 348 ; *Hisutsua Cantoniensis*, DC. Prod. VI. 44 ; *Hisutsua serrata*, Hook. and Arn. Bot. Beech. 265 ; *Chrysanthemum cuneatum*, Roxb. Fl. Ind. III. 436).

HAB. Ava, Khakyen hills (J. Anderson).—Fl. May—September.

**Callistephus, Cass.**

\*1. *C. CHINENSIS*, NE. Aster. 221 ; DC. Prod. V. 274 ; Clark. Comp. Ind. 41. (*Aster Chinensis*, L. sp. pl. 1232 ; Roxb. Fl. Ind. III. 433).

HAB. Cultivated in gardens of Burma (teste Clarke).

**Erigeron, L.**

1. *E. ÆGYPTIACUM*, L. Mant. 112 ; Jacq. Hort. Vindob. III. 19. (*Conyza Ægyptiaca*, Ait. Hort. Kew. III. 183 ; DC. Prod. V. 382 ; Bth. Fl. Austr. IV. 497 ; *E. asteroides*, Roxb. Fl. Ind. III. 432 ; *E. hispidum*, DC. Prod. V. 292 ; Clark. Comp. Ind. 54 ; *Conyza asteroides*, Wall. Cat. 3652, non L. ; DC. Prod. V. 382 ; *Blumea pubiflora*, DC. Prod. V. 434 ; *E. sublyratum*, Roxb. ap. DC. Prod. V. 292 ; *Conyza Jerdoni*, Clark. Comp. Ind. 62, fol. subpinnatifidis et radio apparenter deficiente).

**HAB.** Pegu and Martaban, not unfrequent along the banks of the Sittang ; most probably also elsewhere.—Fl. Fr. May.

The ligulate ray-florets seem to be sometimes absent, at least in dried specimens they appear so. The Egyptian plant agrees in all parts with the Indian, but appears to be often ray-less.

**N. B.** *Conyza angustifolia*, Roxb. Fl. Ind. III. 429. (DC. Prod. V. 83), appears from the description and MS. figure to be a luxuriant form of *E. Canadensis*, L., or *E. linifolius*, Willd., and is, therefore, hardly an Andamanese plant.

### **Gynura**, Cass.

#### *Conspectus of Species.*

Pubescent; leaves rather small, ovate to linear-lanceolate, repand-toothed, acuminate; peduncles and involucre bracts hoary pubescent, ..... *G. Nepalensis*.

Pubescent, the root tuberous; leaves more or less laciniate to pinnatifid; peduncles and involucre-bracts less hairy, ..... *G. sinuata*.

1. *G. NEPALENSIS*, DC. Prod. VI. 3000; Clark. Comp. Ind. 171. (*G. foetens*, DC. l. c.).

**HAB.** Ava, Irrawaddi, on the Pingee rocks (Wallich).—Fl. Oct.

2. *G. SINUATA*, DC. Prod. VI. 301; Clark. Comp. Ind. 173.

**HAB.** Frequent in the eng- and low forests of the Sittang valley in Pegu, and in those of Martaban.—Fl. April, May; Fr. June.

As long as it is young, the plant looks almost scapiferous and the leaves are then simpler and smaller, but at the rate that the tuberous roots enlarge the plant becomes more robust, larger, and branched from the base with the leaves up to 7 in. long.

### **Notonia**, DC.

1. *N. CRASSISSIMA*, DC. Prod. VI. 442. (*Composita*, Griff. Not. Dicot. 252. t. 470).

**HAB.** Ava, on the limestone-hills near Segain (Wall., Griff.).—Fl. May.

### **Emilia**, Cass.

#### *Conspectus of Species.*

Achenes papillose-rough; style-branches erect, half-cylindrical with a short conical appendage; lower leaves more or less lyrate, ..... *E. sonchifolia*.

Achenes quite glabrous; style-branches elongate, recurved, almost club-shaped at the apex; lower leaves elongate-spatulate, ..... *E. prenanthoidea*.

1. *E. SONCHIFOLIA*, DC. Prod. VI. 302; Clark. Comp. Ind. 174. (*Cacalia sonchifolia*, L. sp. pl. 1169, non Forsk.; Roxb. Fl. Ind. III. 413; *Gynura ecalyculata*, DC. Prod. VI. 298; *E. sagittata*, DC. Prod. V. 802; *E. flaccida*, Miq. Fl. Ind. Bat. II. 102; *Senecio sonchifolius*, Bth. Fl. Hongk. 189).

HAB. Common in agrarian and garden land, in deserted toungyas, in waste and rubbishy places, along river-banks, etc., also in the savannahs, all over Burma, from Chittagong and Ava down to Tenasserim.—Fl. C. and HS. ; Fr. HS.

2. E. PRENANTHOIDEA, DC. Prod. V. 303 ; Clark. Comp. Ind. 176 (*E. angustifolia*, DC. l. c.).

HAB. Ava, hills east of Bhamo (J. Anderson).—Fl. Fr. Aug.

### Senecio, L.

#### Conspectus of Species.

Subg. 1. *Eu-Senecio*. Anthers not tailed at the base. Achenes all with, or those of the ray, without pappus.

\* *Achenes all with pappus.*

Almost glabrous, the flower-stems almost scapiform ; lower leaves elongate-cuneate-oblong ; flower-heads short peduncled, in dense corymbs ; achenes of the disk papillose-rough ; pappus white, ..... *S. obtusatus*.

Almost glabrous or more or less hirsute ; leaves narrow-linear, with involute margins ; flower-heads long-peduncled, few ; achenes papillose-rough ; pappus more or less pubescent, ..... *S. Griffithii*.

\* \* \* *Achenes of the ray without pappus.*

Roughish hirsute ; leaves elongate-linear, narrowed at the base ; flower-heads in lax corymbs ; achenes striate, glabrous ; pappus rufescent, ..... *S. saxatilis*.

Subg. 2. *Synotis*. Anthers tailed, the tails free or adnate.

\* *Erect shrubs or undershrubs.*

Stem and leaves beneath white-tomentose ; flower-heads radiate, rather large, in dense corymbos panicles ; achenes glabrous ; pappus white, ..... *S. densiflorus*.

Glabrous or nearly so ; flower-heads small, glabrous, discoid, in small dense corymbs ; achenes glabrous ; pappus white, ..... *S. triligulatus*.

\* \* *Scandent shrubs or undershrubs.*

Stems almost zigzag-flexuose, slightly woolly and glabrescent ; flower-heads discoid, rather large, in divaricate corymbos panicles ; achenes difform, those of the disk 5-gonous with pilose corners and white pappus, the ray-achenes glabrous, almost trigonous. .... *S. Chinensis*.

1. *S. obtusatus*, Wall. Cat. 3133 ; DC. Prod. VI. 367 ; Clark. Comp. Ind. 192.

HAB. Ava, Khakyen hills east of Bhamo. (J. Anderson). Fl. May.

2. *S. Griffithii*, Hf. and Th. MS. ; Clark. Comp. Ind. 193.

Var. *a. GENUINA*, leaves longer and glabrous or nearly so ; flower-heads longer peduncled, the involucre bracts nearly glabrous.

Var. *β. KURZII*, Clark. Comp. Ind. 194. a fruticulose undershrub, the leaves hirsute on both sides or almost chaffy pilose along the midrib beneath ; flower-heads shorter peduncled, the involucre bracts more pubescent.

HAB. Var. *β.* rather frequent on rocks and in open grassy places in the pine-forests of the highest ridges of the Martaban hills, at 6000—7100 ft. elevation.—Fl. Jan., Febr. ; Fr. March.

3. *S. SAXATILIS*, Wall. Cat. 3131 ; DC. Prod. VI. 367.

HAB. Ava, Taong-dong (Wall.).

Judging from the description only it seems allied to *S. linifolius*, *S. pilosulus*, etc.

4. *S. DENSIFLORUS*, Wall. Cat. 3116 ; DC. Prod. VI. 369 ; Clark. Comp. Ind. 185. (*S. angulosus*, DC. l. c. ; *S. uncinellus*, DC. l. c. 368).

HAB. Frequent in grassy and open places in the drier hill-forests, especially the pine-forests, of Martaban, at 3000—6000 ft. elevation.—Fl. Febr., March ; Fr. March, April.

5. *S. TRILIGULATUS*, Ham. in Don. Prod. Fl. Nep. 178 ; DC. Prod. VI. 368. (*S. vagans*, Wall. Cat. 3108 ; DC. Prod. VI. 368 ; Clark. Comp. Ind. 188).

HAB. Ava, Khakyen hills east of Bhamo (J. Anderson).—Fr. March.

6. *S. CHINENSIS*, DC. Prod. VI. 363 ; Bth. Fl. Hongk. 190. (*Cineraria Chinensis*, Spreng. Syst. III. 549 ; *Cineraria repanda*, Lour. Fl. Coch. II. 613, non Willd. ; *S. campylodes*, DC. Prod. VI. 376 ; Clark. Comp. Ind. 183 ; *S. Hindsii*, Bth. in Lond. Journ. Bot. I 488).

HAB. Ava, Khakyen hills, east of Bhamo (J. Anderson).—Fl. March.

#### *Doubtful species.*

7. *S. ? PEGUANUS*, DC. Prod. VI. 365.

HAB. Pegu (Belanger).

This, according to Aug. Pyr. DeCandolle, has the habit, leaves, and achenes of *Cineraria*.

### **Eupatorium, Tournef.**

#### *Conspectus of Species.*

× Leaves penninerved.

Corymbs of few small few-flowered flower-heads, ..... *E. Birmanicum*.

Flower-heads numerous, in corymbose, elongate panicles, ..... *E. Punduanum*.

× × Leaves triplinerved.

Flower-heads numerous, in corymbs, ..... *E. Wallichii*.

1. *E. BIRMANICUM*, DC. Prod. V. 179, *viz* Clarke.

HAB. Ava, Segain (Wall. 3290).

2. *E. PUNDUANUM*, Wall. Cat. 3170 ; DC. Prod. V. 179 ; Clark. Comp. Ind. 33. (*E. nodiflorum*, Wall. Cat. 3166 ; DC. Prod. V. 179 ; Clark. Comp. Ind. 33).

HAB. Burma (*teste* Clarke, non DC.)

Bentham (Fl. Hongk. 172) refers this species to the following, and the penninervation really seems to be a fallacious character.

3. *E. WALLICHII*, DC. Prod. V. 179. (*E. cannabinum*, Clark. Comp. Ind. 34, non L.).

HAB. Upper Burma (*teste* Clarke).

**Mikania, Willd.**

1. *M. SCANDENS*, Willd. sp. pl. III. 1743; DC. Prod. V. 199; Clark. Comp. Ind. 34. (*Eupatorium scandens*, Burm. Fl. Ind. (1746) 176. excl. syn.; *Eupatorium cordatum*, Burm. Fl. Ind. 176 t. 58. f. 2; *Eupatorium volubile*, Vahl. Symb. (1794) III. 93; *M. volubilis*, Willd. sp. pl. III. 1743, DC. Prod. V. 199).

HAB. Upper Tenasserim, Attaran (Wall. Cat. 3174).—Fl. May.

**Ageratum, L.**

1. *A. CONFROIDES*, L. sp. pl. 1175; Hook. Exot. Fl. t. 15; DC. Prod. V. 108; Schlecht. in Linnæa XXXIX. 493, Clark. Comp. Ind. 30. (*Ageratum cordifolium*, Roxb. Fl. Ind. III. 415). •

HAB. A common weed in all cultivated and waste lands, along riversides, deserted toungyas, etc., springing up in the forests wherever light permits, all over Burma and adjacent islands; Andamans, introduced and rapidly spreading. Fl. R. S.

**Adenostemma, Forst.**

1. *A. VISCOSUM*, Forst. Nov. gen. no. 15; DC. Prod. V. 111; Bth. Fl. Hongk. 171; Clark. Comp. Ind. 28. (*Ageratum aquaticum*, Roxb. Fl. Ind. III. 416; *A. fastigiatum*, DC. Prod. V. 111; *A. Roylei*, DC. Prod. V. 112; *A. elatum*, Don Prod. Fl. Nep. 181; DC. Prod. V. 112; Wight Icon. t. 1087; *A. rugosum*, DC. Prod. V. 112; *A. Madurensense*, DC. Prod. V. 112; *A. rivale*, Dalz. in Hook. Kew. Gard. Misc. III. 231).

Var. *a. VERUM*, Clark. Comp. Ind. 29 (incl. varr. *elatum* and *latifolium*, Clark. l. c.), larger, the leaves larger and broader, often somewhat succulent; flower-heads larger; achenes more or less glandular muricate.

Var. *β. MICROCEPHALUM*, Clark. l. c. 29 (*A. microcephalum*, DC. Prod. V. 111), as preceding, but usually thinner and the leaves smaller; heads very small. •

Var. *γ. ANGUSTIFOLIUM*, Clark. l. c. 29 (*A. angustifolium*, Edg. in Journ. As. Soc. Beng. XXI. 173; Walp. Ann. V. 153), leaves elongate-linear, rest as in var. *a*.

Var. *δ. RETICULATUM*, Clark. l. c. 30 (*A. reticulatum*, DC. Prod. V. 112; Wight Icon. t. 1088; *A. leiocarpum*, DC. Prod. V. 112; *A. erectum*, DC. Prod. V. 113), as var. *a*., but leaves somewhat rough above and often more or less lacunose, tawny pubescent on the nerves beneath; achenes smooth.

HAB. var. *a.* frequent in the mixed forests of the Pegu and Arracan Yomah; Ava Hills; var. *β.* along with the typical form but scarcer; var. (?) *γ.* Tenasserim (Helf. 3109).—Fl. Fr. C. and HS.

**Elephantopus, L.**

1. *E. SCABER*, L. sp. pl. 1313; DC. Prod. V. 86; Roxb. Fl. Ind. III. 445; Wight Icon. t. 1086; Bth. Fl. Hongk. 171; Clark. Comp. Ind. 28. (*E.* sp. Griff. Not. Dicot. 222).

HAB. Common in dry grass-land, rubbishy places, along the borders of fields and rivers, of the cultivated plains and also in the mixed forests (especially the upper ones), all over Burma, from Chittagong and Ava down to Tenasserim.—Fl. Sept.—March.

**Ethulia, L.**

1. *E. CONYZOIDES*, L. sp. pl. 1171; Linn. f. Dec. I. t. 1; Bot. Reg. t. 695; DC. Prod. V. 12; Clark. Comp. Ind. 1. (*E. ramosa*, Roxb. Fl. Ind. III. 413).

HAB. Chittagong, banks of the Megna near Comillah (Clarke).—Fl. April, May; Fr. RS.

**Vernonia, Schreb.***Conspectus of Species.*

Subg. 1. *Cyanopsis*. Flower-heads small. Achenes 4—5-cornered or terete, not ribbed. Outer row of pappus bristly or paleaceous. Low annual herbs.

\* *Achenes 4-cornered.* (*Cyanopsis*, Bl.)

Greyish puberulous or thinly pubescent; flower-heads broad, in poor corymbs; involucrel bracts stiff, squarrose, acuminate, ..... *V. Chinensis*.

\* \* *Achenes terete* (Tephrodes).

Greyish puberulous; flower-heads  $2\frac{1}{2}$ —3 lin. long, corymbose-panicled, .... *V. cinerea*.

Subg. 2. *Eu-Vernonia*. Flower-heads rather large or rarely small. Achenes longitudinally ribbed. Involucre-bracts all scarious, not leafy nor leafy-appendaged.

\* *Undershrubs or herbs.* Involucre-bracts elongate, especially the inner ones, and usually narrow.

× Outer involucrel bracts subulate and squarrose, passing on to the peduncle. Outer pappus consisting of numerous almost chaff-like bristles.

Slightly puberulous; leaves narrow or broad, shortly petioled or almost sessile; flower-heads rather large, on long stiff peduncles, corymbose-panicled; achenes densely villous, ..... *V. bracteolata*.

× × Outer involucrel bracts rather broad and short, more or less appressed-imbricate.

+ Outer series of pappus consisting of a few caducous bristles or almost wanting.

† Flower-heads large, many-flowered, solitary or few, or in poor corymbs. Involucrel-bracts very acuminate. Marsh-leaved undershrubs or herbs. (*Xipholepis*.)

Flower-heads long-peduncled, in lax corymbs; achenes 2 lin. long, glabrous; bristles of pappus bristly, ..... *V. bracteata*.

Flower-heads short-peduncled, in compact corymbs; achenes 1 lin. long, sparingly pilose; bristles of pappus smooth, ..... *V. Roxburghii*.

Flower-heads sessile or nearly so, clustered or solitary; achenes 1 lin. long, appressed pilose; bristles of pappus smooth, ..... *V. squarrosa*.

+ + Flower-heads small or rather small, few- (not above 15-) flowered, in ample corymb-like panicles. Involucral bracts bluntish or hardly acuminate. (*Gymnanthemum*.)

Roughish puberulous; leaves narrow, rarely broad; flower-heads only 3 lin. long, numerous, in axillary and terminal corymbs, ..... *V. aspera*.

Roughish puberulous; leaves rather broad or narrow; flower-heads 4—5 lin. long, shortly peduncled, in axillary and terminal paniced corymbs, ..... *V. saligna*.

+ + Outer series of pappus consisting of numerous or copious bristles. Involucral bracts acuminate. (*Lepidaploa*.)

Leaves broad, roughish puberulous; flower-heads peduncled, in small sessile pubescent axillary corymbs, or corymbose-paniced at the end of the branches; involucral bracts white woolly, ..... *V. Kingii*.

Leaves narrow, roughish puberulous, chartaceous; flower-heads shortly peduncled or sessile, solitary or few in the leaf-axils, irregularly disposed raceme-like or forming terminal poor corymbs; involucral bracts nearly glabrous, ..... *V. attenuata*.

\* \* Large shrubs or trees, rarely scandent. Flower-heads usually small and few-flowered.

• × Pappus more or less tawny to red-brown. Involucre-bracts elongate especially the inner ones. Scandent shrubs.

Glabrous or nearly so; flower-heads  $\frac{1}{2}$  in. long, shortly peduncled, in small corymbs paniced at the end of the branches; leaves petioled; achenes pilose, .. *V. blanda*.

As preceding, but shortly puberulous; achenes glabrous, ..... *V. scandens*.

• × × Pappus white or whitish to pale straw-coloured. Involucre-bracts short and rather broad. Flower-heads small. (*Strobocalyx*.)

+ Trees or erect shrubs.

× Leaves sessile or very shortly petioled.

Small tree, pubescent or puberulous; leaves cuneate-narrowed, shortly petioled; flower-heads shortly peduncled, corymbulose, in terminal leafless panicles; involucre-bracts slightly and fugaceously appressed pubescent, .... *V. volkameriaefolia*.

× × Leaves rather long-petioled.

Meagre shrub or small tree, softly tomentose; leaves broad; flower-heads shortly peduncled, corymboso-paniced; involucral bracts densely white-tomentose,

.. *V. Kurzii*.

Tree; leaves coriaceous, long-petioled, densely tomentose beneath, glabrescent above or rarely also beneath; flower-heads sessile or nearly so, clustered, in corymb-like tomentose panicles; involucre-bracts thinly appressed pilose, ..... *V. arborea*.

+ + Scandent shrubs.

Stem and leaves beneath appressed silvery pubescent; flower-heads almost sessile, divaricate corymbose and paniced; involucre-bracts glabrous, ciliate, \*

.. *V. claeagnifolia*.

Subg. 3. *Hololepis*. Outer involucre entirely leafy and large, or smaller and produced into a leafy appendage.

Outer involucre-bracts large and leafy, entirely concealing the inner ones (*Hololepis*, DC.).

Leaves broadly oval, almost sessile, rather glabrous; flower-heads peduncled, corymbose, ..... *V. calycina*.

\* Outer involucre-bracts scarious, produced at the tips into a foliaceous linear appendage. (Stongolia.)

Shortly and thinly pubescent; leaves petiolod; flower-heads corymbose; pappus rufescent, ..... *V. anthelminthica*.

1. *V. CINEREA*, Less. in Linn. 1829, 291 and 1831. 673; DC. Prod. V. 24; Bth. Fl. Austr. IX. 459; Clark. Comp. Ind. 20. (*Conyza cinerea*, L. sp. pl. 1208; *Serratula cinerea*, Roxb. Fl. Ind. III. 406; *V. abbreviata*, DC. Prod. V. 25; *V. physalifolia*, DC. l. c. 24; *V. laxiflora*, Less. in Linn. 1831. 646; DC. Prod. V. 25; *Chrysocoma purpurea*, G. Forst. Prod. 54).

HAB. Common, not only in all leaf-shedding forests but still more so in all cultivated and waste lands, along river-banks, on old pagodas, etc., all over Burma, down to Tenasserim, up to 4000 ft. elevation; Andamans, introduced and now common.—Fl. Fr. C. S.

2. *V. CHINENSIS*, Less. in Linn. 1831. 674; Miq. Fl. Ind. Bat. II. 18; Bth. Fl. Hongk. 169; Clark. Comp. Ind. 18. (*Conyza Chinensis*, Lamk. Dict. II. 83, non L.; *Cyanopsis pubescens*, Bl. Bydr. 890; DC. Prod. V. 69; *Cyanopsis villosa*, DC. Prod. V. 69).

HAB. Frequent, especially in rubbishy and waste places in and around villages, along river-banks, etc., of the cultivated plains, less so in open places of the mixed forests, all over Pegu, Arracan, Martaban, and Tenasserim.—Fl. Aug.—Jan.; Fr. CS.

3. *V. BRACTEOLATA*, DC. Prod. V. 62. (*V. subsessilis*, DC. Prod. V. 62; Clark. Comp. Ind. 10).

Var. *a. BRACTEOLATA*, Clark. Comp. Ind. 10, leaves obovate to obovate-oblong, acute; pappus often darker rufescent.

Var. *β. SUBSESSILIS*, Clark. l. c., lower, the leaves linear to linear-oblong, acuminate; pappus usually paler coloured.

HAB. Ava, Khakyen hills, east of Bhamo (J. Anderson).—Fl. Fr. CS.

4. *V. BRACTEATA*, Wall. Cat. 2921; Clark. Comp. Ind. 17. \* (*Decaneuron Silhetense*, DC. Prod. V. 67; Wight Icon. t. 1083).

HAB. Karenee hills (Revd. F. Mason).

5. *V. ROXBURGHII*, Less. in Linn. 1831. 674. (*Eupatorium asperum*, Roxb. Fl. Ind. III. 415; *V. aspera*, DC. Prod. V. 31, non Ham.; Clark. Comp. Ind. 17).

HAB. Ava, apparently frequent about Bhamo and the hills east of it.—Fl. CS.; Fr. C. and HS.

6. *V. SQUARROSA*, Less. in Linnæa 1831. 627, note of p. 678. (*V. teres*, Wall. Cat. 2926; DC. Prod. V. 15; Clark. Comp. Ind. 16; *Acilepis squarrosa*, Don Prod. Nep. 169; *V. rigiophylla*, DC. Prod. V. 15).

HAB. Frequent in the eng and dry forests of Pegu, Prome, and Ava.—Fl. CS.; Fr. HS.

Lessing called two different plants by the above name, but according to the laws of priority Don's name has precedence, and the Brazilian plant must be called either *V. rubricaulis*, Less. or *V. plantaginoides*, Less., two names for the same plant published two years previously to Lessing's Brazilian *V. squarrosa*.

7. *V. ASPERA*, Ham. in Trans. Linn. Soc. XIV (1825) 219, vix Less., nec DC. Clark. et c. (*V. multiflora*, Less. in Linn. 1831. 642 ; DC. Prod. V. 31 ; *Decaneuron divergens*, DC. in Wight Contr. 8 and Prod. V. 68 ; Wight Icon. t. 1084 ; *V. divergens*, Clark. Comp. Ind. 64 ; *Eupatorium divergens*, Roxb. Fl. Ind. III. 415 and Icon. MS. XIII. t. 23).

Var. *β. NILGHERYENSIS*, (*V. Nilgherryensis*, DC. Prod. V. 32 ; Wight Icon. t. 1078 ; *V. aspera*, Less. in Linn. 1831. 643 ?), more pubescent, the pappus white or nearly so.

HAB. Var. *α.* frequent in all leaf-shedding forests, along river-sides, etc. all over Burma, from Chittagong and Ava down to Tenasserim ; freely springing up in deserted toungyas and also in the savannahs.—Fl. CS. ; Fr. HS.

8. *V. SALIGNA*, DC. Prod. V. 33 ; Clark. Comp. Ind. 13. (*V. longicaulis*, DC. Prod. V. 33).

Var. *α. GENUINA*, corymbs more or less paniced ; involucre-bracts more acute to mucronate-acuminate, more glabrous.

Var. *β. PEGUENSIS* (*V. Peguensis*, Clark. Comp. Ind. 13), a shade-form, panicles spreading, terminal, leafless ; involucre-bracts more or less acute, usually more glabrous.

HAB. Var. *α.* Ava, Khakyen hills (J. Anderson) ; Chittagong, Seetakhund hill ; var. *β.* in the upper-mixed forests of the southern parts of the Pegu Yomah.—Fl. CS. ; Fr. C. and HS.

9. *V. KINGII*, Clark. Comp. Ind. 12.

HAB. Here and there in the tropical and moister upper-mixed forests of the southern slopes of the Pegu Yomah, and in those of Martaban east of Toung-hoo ; also Ava, Khakyen hills (J. Anderson).—Fl. Fr. CS.

10. *V. ATTENUATA*, DC. Prod. V. 33 ; Clark. Comp. Ind. 12.

Var. *α. GENUINA*, flower-heads about half an inch across, longer or shorter peduncled and usually in the axils of the leaves.

Var. *β. JUNCEA*, judging from the material at hand, the whole plant seems to be transformed into an ample leafless panicle, the flower-heads only half the size, all sessile and solitary, in very elongate slender poor spikes ; achenes only a line long or somewhat longer, the pappus pale rufous.

HAB. Var. *α.* Upper Tenasserim, Moulmein (Falconer) ; var. *β.* adjoining Siamese province of Radburi (Teymann).—Fl. Fr. CS. ; Fr. C. and HS.

Var. *β.* may form a distinct species, but there are no leaves.

11. *V. BLANDA*, DC. Prod. V. 32; Clark. Comp. Ind. 25. (*V. blandula*, Clark. Comp. Ind. 26; *V. Andersonii*, Clark. Comp. Ind. 27).

HAB. Rather frequent in the grass jungles along choungs and desert-ed toungyas of the Pegu Yomah and Martaban; Upper Tenasserim.—Fl. Fr. Jan., Febr.

*V. Andersonii* (Birma. Griff. 3099) has the receptacle densely hirsute, but in *V. blanda*, as well as in *V. blandula*, the same is also hispid, although much less so.

12. *V. SCANDENS*, DC. Prod. V. 32; Clark. Comp. Ind. 26. (*Decaneuron obovatum*, DC. Prod. V. 67; Miq. Fl. Ind. Bat. II. 21; *V. vagans*, DC. Prod. V. 32; Clark. Comp. Ind. 26).

HAB. Pegu (R. Scott); Ava hills, up to 4000 ft. elevation.—Fl. Fr. CS.

13. *V. VOLKAMERLEFOLIA*, DC. Prod. V. 32; Bedd. Fl. Sylv. Madr. t. 225. (*V. acuminata*, DC. Prod. V. 32, non Less.; Clark. Comp. Ind. 22; *V. Punduana*, DC. Prod. V. 32; *V. cuspidata*, Buek Ind. Cand. II. p. V).

HAB. Not unfrequent in the drier hill and the hill-eng-forests of Martaban, at 2—4000 ft. elevation; Ava, Khakyen hills (J. Anderson).—Fl. Febr., March; Fr. April.

14. *V. KURZII*, Clark. Comp. Ind. 24.

HAB. Not unfrequent in the drier hill-forests of Martaban east of Tounghoo, at 2—3000 ft. elevation, often springing up amongst the shrubs of poonzohs.—Fl. March; Fr. April.

15. *V. ARBOREA*, Ham. in Trans. XIV. (1825) 215; DC. Prod. V. 22; Clark. Comp. Ind. 23. (*V. Javanica*, DC. Prod. V. 22; *Eupatorium Javanicum*, Bl. Bydr. (1826) 903; *V. Blumeana*, DC. Prod. V. 22).

HAB. Tenasserim (Helf. 3103).

16. *V. ELÆAGNIFOLIA*, DC. Prod. V. 22; Clark. Comp. Ind. 24.

HAB. Upper Tenasserim, Moulmein. (Wall.; Falc.) and adjoining Siamese provinces (Teysmann).—Fl. Jan., March; Fr. HS.

17. *V. CALYCINA*, Wall. Cat. 2924; DC. Prod. V. 60; Clark. Comp. Ind. 9.

HAB. Prome (Wall.).

18. *V. ANTHELMINTHICA*, Willd. sp. pl. III. 1634; DC. Prod. V. 61; Clark. Comp. Ind. 10. (*Onyza anthelmintica*, L. sp. pl. 1207; *Serratula anthelmintica*, Roxb. Fl. Ind. III. 405).

HAB. Ava, Taongdong (Wall.).

#### Tricholepis, DC.

1. *T. KARENSIUM*, Kurz in Journ. As. Soc. Beng. 1872. 318; Clark. Comp. Ind. 238 (*Karensis*).

HAB. Martaban hills, Yoonzeleen (Brandis, O'Riley); Karenee hills (Rev. F. Mason).

**Carthamus, L.**

1. *C. TINCTORIUS*, L. sp. pl. 1162; Roxb. Fl. Ind. III. 409; Bot. Reg. t. 170; DC. Prod. VI. 612; Clark. Comp. Ind. 244.

HAB. Much cultivated in Prome District.—Fl. March, April.

There are two forms in cultivation, the one with almost entire leaves and involucre leaves and very slightly and shortly spiny, and the other, coming near *C. oxyacanthu*, armed with long spreading spines.

**Cnicus, L.***Conspectus of Species.*

*Corolla limb bell-shaped, 5-cleft to the middle. Flower-heads bisexual, the inner involucre bracts not in any way dilated at the tips, but terminating in spines.*

Leaves white-tomentose beneath, pinnatifid, spiny; flower-heads large, hemispherical, arachnoid-woolly, ..... *C. eriophorus*.

\* \* *As preceding section, but the inner involucre bracts dilated into a terminal appendage.*

Slender but stiff; leaves narrow, entire or somewhat sinuate-lobed, shortly spiny, usually whitish tomentose beneath; flower-heads rather small, not leafy-involucre at the base, long-peduncled, ..... *C. Chinensis*.

1. *C. ERIOPHORUS*, Hoffm. Deutsch Fl. 286; Roth Tent. Fl. germ. II. 286; Clark. Comp. Ind. 217, (*Cirsium eriophorum*, Scop. Flor. Carn. II. 130; DC. Prod. VI. 638; Koch Syn. Fl. Germ. 743; *Carduus eriophorus*, L. sp. pl. 1153; Jacq. Austr. t. 171; Engl. Bot. t. 386).

Var.  $\beta$ . *INVOLUCRATUS*, Clark. Comp. Ind. 217 (*Cirsium involucreatum*, DC. Prod. VI. 639), leaves above covered with sharp sometimes spine-like bristles; involucre-bracts glabrescent; florets purple.

HAB. Var.  $\beta$ . Karenee country (O'Riley); Ava, Kakhien hills east of Bhamo (J. Anderson).—Fl. August, September.

2. *C. CHINENSIS*, Clark. Comp. Ind. 219. (*Sinensis*). (*Cirsium Chinense*, Gard. and Champ. in Hook. Kew. Journ. Bot. I. 823; Bth. Fl. Hongk. 168).

HAB. Ava, hills east of Bhamo.

**Saussurea, DC.***Conspectus of Species.*

Leaves lyrate with a deltoid or hastate end-lobe, the upper cauline ones often entire or lobed, tomentose beneath; flower-heads long-peduncled, laxly racemose and paniced, the involucre-bracts nigrescent, often blunt and erose-toothed, *S. deltoidea*.

Leaves pinnatifid, also the cauline ones, the end-lobe rather elongate, tomentose beneath; flower-heads shortly peduncled or almost sessile, clustered and forming an elongate contracted almost raceme-like panicle, the involucre-bracts greyish villous, acute, ..... *S. Peguensis*.

1. *S. DELTOIDEA*, Clark. Comp. Ind. 235 (*Aplotaxis deltoidea*, DC. Prod. VI. 541; *Aplotaxis nivea*, DC. Prod. VI. 541.)

Var. *a.* VERA, Clark. Comp. Ind. 236 (incl. var. *β.* *nivea*, Clark. l. c.), flower-heads long-peduncled, laxly racemose, larger, the involucre-bracts nearly entire at the tips; upper leaves entire or the end-lobe deltoid and large.

Var. *β.* POLYCEPHALA, Clark. Comp. Ind. 236, flower-heads smaller, shorter peduncled, and more crowded, laxly racemose and paniced, the involucre-bracts blunt and crose-toothed; upper leaves or their end-lobe sagittate.

HAB. Var. *a.* Martaban on the Nattoung hill (Rev. F. Mason); var. *β.* frequent in open and grassy places in the drier hill-, especially the pine-forests on the highest ridges of the Martaban hills, at 6000—7100 ft. elevation.—Fr. March.

2. S. PEGUENSIS, Clark. Comp. Ind. 235.

HAB. Karen hills (O'Riley).

### Dicoma, Cass.

1. D. TOMENTOSA, Cass. Bull. phil. 1818.; Dict. XIII. 195 and XLVII. 503; DC. Prod. VII. 36; Clark. Comp. Ind. 36.—(*D. lanuginosa*, DC. Prod. VII. 36; Wight Icon. t. 1140).

HAB. Ava, limestone-hills about Segain (Wall.).—Fl. Fr. Nov.

N. B. *Hochstetteria Schimper*, Clark. Comp. Ind. 246, non DC. = *Pegolettia Senegalensis*, Cass. I cannot see in what *Hochstetteria* and *Pegolettia* do differ, and still less can I understand how they can be placed almost at the opposite ends of the order, considering that two of the *Pegolettias* have the corolla even more bilabiate than are those of *Hochstetteria Schimper*, as figured by A. Pyr. De Candolle.

### Leucomeris, Don.

#### *Conspectus of Species.*

Flower-heads on short slender peduncles or almost sessile, in peduncled corymbs from the axils of the upper-leaves and terminal; leaves almost coriaceous, white-tomentose beneath, ..... *L. spectabilis*.

Flower-heads solitary, in dense terminal umbel-like corymbs, the involucre bracts gradually shorter and passing into the thick short densely imbricate-bracted peduncle; leaves membranous, glabrous, ..... *L. decora*

1. L. DECORA, Kurz in Journ. As. Soc. Beng. 1872. 317; Clark. Comp. Ind. 245.

HAB. Not unfrequent in the eng- and dry forests of the Prome District.—Fl. March; Fr. May.

### Ainsliea, DC.

#### *Conspectus of Species.*

× Leaves narrowed at the base and decurrent wing-like on the petiole.

Sparingly pilose, the flowering stems more or less sessile-leaved; leaves membranous obscurely crenate-toothed; flower-heads sessile or peduncled, in lax spikes or diffuse narrow panicles, ..... *A. pteropoda*.

× × Leaves more or less cordate at the base, the petiole not winged.

Flowering stem leaved, the leaves thin membranous, sinuate-toothed, long-petioled, sparingly pilose or almost glabrous; flower-heads sessile, or peduncled, in racemes or panicles, ..... *A. aptera*.

Flowering stem radical and almost scapiform and leafless; leaves almost coriaceous, entire, hirsute, often glabrescent above, densely villous-fringed; flower-heads peduncled, in diffuse panicles, ..... *A. Brandisiana*.

1. *A. PTEROPODA*, DC. Prod. VII. 14; Clark. Comp. Ind. 246.

Var. *a. GENUINA* (*A. pteropoda* *β. lobelioides*, Clark. Comp. Ind. 246; *A. pteropoda*, DC. l. c.; *A. Silhetensis*, Clark. in Linn. Journ. XIV. 411), flower-heads sessile, usually clustered, forming a simple elongate lax spike.

Var. *β. EFFUSA*, Clark. l. c., flower-heads slenderly peduncled, almost racemose, forming a spreading narrow panicle.

HAB. Var. *a.* frequent in open grassy places of the drier hill-, especially the pine-forests, and on the hill-pastures of the higher ridges of the Martaban hills, at 5000—7100 ft. elevation; Upper Tenasserim, top of Moo-lee (Rev. Parish).—Fl. Fr. March.

2. *A. BRANDISIANA*, Kurz in Journ. As. Soc. Beng. 1872. 318; Clark. Comp. Ind. 247.

HAB. Not unfrequent along choungs in the damp hill-forests of the Martaban hills, at 2000—4000 ft. elevation.—Fl. March.

#### *Gerbera*, Gron.

1. *G. PILOSELLOIDES*, Cass. Dict. XVIII. 461; DC. Prod. VII. 16; Bth. Fl. Hongk. 191. (*Arnica piloselloides*, Linn. Amoen. VI. 103; *G. ovalifolia*, DC. Prod. VII. 17; Clark. Comp. Ind. 249).

HAB. Karenee hills (Rev. F. Mason.)

The Cape-plant grows on sand-hills and has larger flower-heads and shorter, more robust scapes.

#### *Cichorium*, L.

\*1. *C. INTYBUS*, L. sp. pl. 1142; Engl. Bot. t. 539; DC. Prod. VII. 84; Koch Syn. Fl. Germ. 357; Clark. Comp. Ind. 250.

Var. *a. GENUINA*, floral leaves from a broader half-stem-clasping base, lanceolate, the lower leaves often runcinate.

Var. *β. ENDIVIA*, Clark. Comp. Ind. 250. (*C. Endivia*, L. sp. pl. 1142; DC. Prod. VII. 84; Koch Syn. Fl. Germ. 357), floral leaves broadly ovate, half-stem-clasping with a cordate base, the lower leaves usually only sinuate.

HAB. Var. *β.* cultivated in gardens of the drier parts of Burma, as Prome.—Fl. CS.

#### *Crepis*, L.

1. *C. JAPONICA*, Bth. Fl. Hongk. 194. (*Prenanthes Japonica*, L. Mant. 107; Thbg. Fl. Jap. 302; *Youngia Japonica*, DC. Prod. VII. 194;

*Prenanthes lyrata*, Thbg. Fl. Jap. 303; *Crepis lyrata*, Clark. Comp. Ind. 253; *Youngia Mauritiana*, DC. Prod. VII. 192; *Prenanthes procumbens*, Roxb. Fl. Ind. III. 404; *Youngia Thunbergiana*, DC. Prod. VII. 192; *Youngia runcinata*, DC. Prod. VII. 192; *Youngia napifolia*, DC. Prod. VII. 193; Wight Icon. t. 1147; *Youngia ambigua*, DC. Prod. VII. 193; *Youngia Poosia*, DC. Prod. VII. 193; *Youngia striata*, DC. Prod. VII. 193; *Prenanthes striata*, Bl. Bydr. 835).

HAB. Frequent in garden-land and in toungyas under cultivation, in betel-nut-gardens, &c., of the Martaban hills; also Ava-hills, apparently frequent.—Fl. Fr. Jan.—March.

### Hieracium, L.

1. H. SILTHETENSE, DC. Prod. VII. 218; Clark. in Journ. Linn. Soc. XIV. 411. and Comp. Ind. 257.

HAB. Tenasserim (Helf. 3369).

### Lactuca, L.

#### Conspectus of Species.

Stout annual; leaves runcinate and spinulose-toothed, half-stem-clasping with a sagittate base; panicle large, furnished with auricled stem-clasping bracts; flower-heads nearly  $\frac{1}{2}$  in. long, ..... *L. Scariola*.

Slender annual; leaves linear, entire or runcinately lobed, sessile with a sagittate base; panicle lax and corymb-like, poor, the bracts subulate, small; flower-heads rather broad, 3—3 $\frac{1}{2}$  lin. long, ..... *L. polycephala*.

1. L. SCARIOLA, L. sp. pl. 1119; DC. Prod. VII. 137; Hayn. Arzn. Gew. I. t. 46; Koch Syn. Fl. Germ. 369; Clark. Comp. Ind. 263.

Var.  $\alpha$ . GENUINA, panicle pyramidal.

\*Var.  $\beta$ . SATIVA, Clark. Comp. Ind. 263 (*L. sativa*, L. sp. pl. 1118; DC. Prod. VII. 138; Hayn. Arzn. Gew. V. t. 30; Koch Syn. Fl. Germ. 369), panicle fastigiate.

HAB. Cultivated in the drier parts of Burma, as in Promé.—Fl. CS.; Fr. HS.

2. L. POLYCEPHALA, Bth. Clark. Comp. Ind. 272. (*Ixeris polycephala*, Cass. Dict. XXIV. 50; DC. Prod. VII. 151; *Ixeris fontinalis*, DC. l. c.)

HAB. Ava, Tapan near Bhamo (J. Anderson).—Fr. Feb.

N. B. *Lactuca bialata*, Griff. Not. Dicot. 1854. 247, = *L. brevirostris*, Champ. (1852).

### Prenanthes, L.

#### Conspectus of Species.

× Leaves pinnatifid to pinnate.

Annual, almost glabrous; panicle lax and spreading, ..... *P. Khasiana*.

× × Leaves simple.

Leaves sagittate, the petiole long and broadly leafy-winged and sagittately or auricular-dilated at the base; panicle lax, the flower-heads nearly  $\frac{1}{2}$  in. long, nodding, on slender bracted peduncles, .. *P. alata*.

Leaves, at least the cauline ones, sessile with a sagittate base; flower-heads long and slenderly peduncled, forming a narrow terminal panicle, ..... *P. Hothæ*.

1. *P. ALATA*, Hf. and Thoms.; Clark. Comp. Ind. 274.

HAB. Grassy open places in the drier hill-forests of the higher ridges of the Martaban hills, at 5—6000 ft. elevation.

2. *P. HOTHÆ*, (*Sonchus Hothæ*, Clark. Comp. Ind. 276).

HAB. Ava, Khakyen hills east of Bhamo (J. Anderson).—Fl. Fr. Aug.

The base of the involucre bracts becomes slightly thickened and indurated in fruit, but the inflorescence and the narrow few- and apparently purple-flowered flower-heads are those of a *Prenanthes*, not of *Sonchus*.

### *Sonchus*, L.

#### *Conspectus of Species.*

\* \* *Involucre bracts glabrous or puberulous, but not glandular-pilose or hispid.*

Achenes much compressed, 3-ribbed on both sides, the ribs perfectly or almost perfectly smooth; leaves usually runcinnate-pinnatifid, ..... *S. asper*.

Achenes compressed, the ribs marked with transverse asperities, and mucate; leaves runcinnate-pinnatifid or simple, ..... *S. oleraceus*.

\* \* *Involucre bracts and peduncles glandular-hispid or glandular-pilose.*

Achenes hardly compressed, the ribs thick and transversely mucate; leaves more or less slightly runcinnate, the upper ones simple, ..... *S. arvensis*.

1. *S. OLERACEUS*, L. sp. pl. 1116; Roxb. Fl. Ind. III. 402; Hayn. Arzn. Gew. II. t. 48; Fl. Dan. t. 682; Koch Syn. Fl. Germ. 371; Clark. Comp. Ind. 275. (*S. ciliatus*, Lamk. Fl. Franc. II. 87; DC. Prod. VII. 185; Wight Icon. t. 1141; *S. Wallichianus*, DC. Prod. VII. 185).

HAB. Ava.—Fr. June.

2. *S. ASPER*, Vill. Delph. III. 158; Hayn. Arzn. Gew. II. t. 48; Koch Syn. Fl. Germ. 371; Clark. Comp. Ind. 275. (*S. fallax*, Wallr. Sched. 432; Fl. Dan. t. 893; DC. Prod. VII. 185).

HAB. Burma (*teste* Clarke).

3. *S. ARVENSIS*, L. sp. pl. 1116; Engl. Bot. t. 674; DC. Prod. VII. 187; Koch Syn. Fl. Germ. 371; Clark. Comp. Ind. 276. (*S. Orizensis*, Roxb. Fl. Ind. III. 402; *S. Wightianus*, DC. Prod. VII. 187; Wight Icon. t. 1142).

HAB. Not unfrequent in cultivated and rubbishy places, in toungyas and betel-nut-gardens, etc., also along river-banks, of the Martaban hills; Ava, Bhamo (J. Anderson).—Fl. April, May; Fr. June.

**Microrhynchus, Less.***Conspectus of Species.*

Leaves narrow, slightly-lobed or entire; flowering stems erect; achenes strongly 4—5 ribbed, the ribs smooth, ..... *M. acaulis*.

Leaves pinnatifid with the lobes all rounded; flowering stems divaricate and much dichotomously branched; achenes strongly 10—12-ribbed, the ribs transversely wrinkled, ..... *M. asplenifolius*.

1. *M. ACAULIS* (*Prenanthes acaulis*, Roxb. Fl. Ind. III. 403; *Youngia acaulis*, DC. Prod. VII. 193; *Prenanthes* sp. Griff. Not. Dicot. 251. t. 469; *M. glaber*, Wight Icon. t. 1145; *Lactuca glabra*, DC. in Wight Contr. 26 and Prodr. VII. 135; Clark. Comp. Ind. 272).

HAB. Frequent in savannahs and other grassy places, along and in the bed of stony choungs, etc., all over Burma, from Ava and Martaban down to Tenasserim.—Fl. March, April; Fr. April, May.

2. *M. ASPLENIFOLIUS*, DC. Prod. VII. 181; Clark. Comp. Ind. 276. (*Prenanthes asplenifolia*, Roxb. Fl. Ind. III. 404).

HAB. Not unfrequent on dried up beds of the Irrawadi and in fields in Pegu.—Fl. Jan.

De Candolle cites *Hieracium dichotomum*, Roxb. Fl. Ind. III. 404; there is no such name in Roxburgh's book, and *Prenanthes asplenifolia* was no doubt meant.

**CAMPANULACEÆ.***Conspectus of Genera.*

Subord. 1. **CAMPANULEÆ.** Corolla regular, more or less bell-shaped to almost rotate. Anthers free. Ovary 2—3—5-celled.

\* Capsule opening by an apical opercle-like disk.

SPHENOCLEA. Stigma shortly 3-lobed. Ovary 2-celled.—Glaucous herbs. Flowers in dense spikes.

\* \* Capsule dehiscing by pores or valves.

× Stigma lobed.

+ Fruit a capsule. Corolla bell-shaped.

WAHLENBERGIA. Capsule dehiscing by 3—5 apical valves bearing the septa. Herbs.

CAMPANULA. Capsule opening laterally by 3 or 5 pores.

+ + Fruit a berry.

CAMPANUMEA. Corolla bell-shaped. Berry supported by the adherent large calyx-lobes.—Twining herbs, the juice milky. Flowers yellowish.

CYCLODON. Corolla shallowly bell-shaped. Calyx-lobes linear, entire or lacinate, adnate to the base of the ovary or free. Erect annuals, the juice milky. Flowers small, white.

PENTAPHRAGMA. Corolla persistent, the tube short. Stigma shortly 3-lobed. Calyx-lobes broad and blunt. Succulent herbs. Flowers in one-sided bracted racemes.

× × Stigma capitate.

CEPHALOSTIGMA. Corolla almost rotate, deeply cleft, the lobes linear. Capsule dry. Delicate herbs.

*Subord. 2. LOBELIEÆ.* Corolla irregular, usually more or less slit on the back. Anthers united round the style. Ovary 2-celled.

\* *Anthers united round the style. Ovary 2-celled. (Eu-Lobeliae).*

PRATIA. Berry indehiscent. The 2 upper anthers terminated by a single bristle. Herbs.

LOBELIA. Capsule herbaceous or membranous, dehiscent. The upper 2, or all the anthers bearded. Small or tall herbs.

\* \* *Anthers free. Ovary 1 or 2-celled. (Goodeniaceae).*

SCHVOLA. Corolla 1- or 2-lipped, posteriorly split to the base. Soft-wooded trees or shrubs.

### Sphenoclea, Gärtn.

1. S. ZEYLANICA, Gärtn. Fruct. I. 183. t. 24; Roxb. Fl. Ind. ed. Wall. II. 106; Miq. Fl. Ind. Bat. II. 569.—(*Sph. Pongatium*, DC. Prod. VII. 548; Wight Ill. t. 138; *Sph.* sp. Griff. Not. Dicot. 276).

HAB. Frequent in agrarian lands, especially in wet fields, along river-banks, etc., all over Burma.—Fl. Fr. C. and HS.

### Wahlenbergia, Schrad.

1. W. GRACILIS, DC. Prod. VII. 433; Bth. Fl. Austr. IV. 137; Smith Emot. Bot. t. 45; Bot. Mag. t. 691.—(*W. agrestis*, DC. l. c. 434; Wight Icon. t. 1175; Hf. and Th. in Linn. Proc. II. 21, cum syn.; *Campanula dehiscens*, Roxb. Fl. Ind. ed. Wall. II. 96; *Campanula agrestis*, Wall. in Roxb. Fl. Ind. II. 97).

HAB. Not unfrequent in fallow agrarian lands of the Prome and Irrawaddi Districts.—Fr. April.

### Campanula, Fuchs.

1. C. CANESCENS, Wall. Cat. 1289; DC. Prod. VII. 473. (*Cephalostigma spathulatum*, Thwait. Ceyl. Pl. 422).

HAB. Frequent on brick-work of old pagodas, on rock-walls, &c., of the dry and eng forests of Prome, Pegu, and Martaban.—Fl. Febr.—April.

### Campanumcea, Bl.

1. C. JAVANICA, Bl. Bydr. 726; Hf. and Th. in Linn. Proc. II. 9. (*Codonopsis Javanica*, Hf. and Th. in Ill. Him. Plant, t. 16. B; *Codonopsis cordata*, Hassk. Retz. I. 9; Miq. Fl. Ind. Bat. II. 566, var. fol. subt. sparse hirsutis).

HAB. Martaban, Karen hills (O'Riley).

### Cyclocodon, Griff.

#### Conspectus of Species.

Calyx-segments removed from the ovary by means of the ovary-stalk, *C. parviflorum*.  
Calyx-segments halfway adnate to the sessile ovary, . . . . . *C. lancifolium*.

1. *C. LANCIFOLIUM*, Kurz in Flora 1872. 308. (*Campanula lancifolia*, Roxb. Fl. Ind. ed. Wall. II. 96; *C. truncatum*, Hf. and Th. in Linn. Proc. II. 18; *Odonopsis truncata*, Wall. Cat. 1301; DC. Prod. VII. 423; *Odonopsis albiflora*, Griff. Not. Dicot. 279; *C. distans*, Griff. Icon. Dicot. t. 481; *Odonopsis leucocarpa*, Miq. Fl. Ind. Bat. II. 565).

HAB. Not unfrequent on shady moist rock-walls along choungs, in the tropical forests of the Pegu Yomah, Martaban, and Chittagong down to Tenasserim, up to 3000 ft. elevation; also Ava, Pingee rocks in the Irrawaddy, just above the images (Wall.).—Fl. Fr. Febr., March.

#### **Pentaphragma, Wall.**

1. *P. BEGONIÆFOLIUM*, Wall. Cat. 1313; DC. Prod. VII. 495. (*Phyteuma begonifolium*, Roxb. Fl. Ind. ed. Wall. II. 108; Jack in Mal. Misc. in Hook. Bot. Misc. I. 277. t. 57).

HAB. Tenasserim, Mergui (Griff.).

#### **Cephalostigma, A. DC.**

1. *C. PANICULATUM*, A. DC. Prod. VII. 421.

HAB. Common on laterite and calcareous grounds in the eng and dry forests all over Prome, Pegu, and Martaban.—Fl. Decb.—Febr.; Fr. Jan.—March.

N. B.—*Wahlenbergia perotifolia*, WA., Wight Icon. t. 842, appears to me to belong to *C. hirsutum*, not to the above, as Hooker and Thomson state.

#### **Pratia, Gaud.**

1. *P. NUMMULARIA*, Bth. (*Lobelia nummularia*, Lamk. Diet. III. 589; *Piddingtonia nummularia*, DC. Prod. VII. 341; *Lobelia begonifolia*, Wall. in Asiat. Res. XIII. 377; Roxb. Fl. Ind. ed. Wall. II. 115; *Pratia begonifolia*, Lindl. Bot. Reg. t. 1373).

HAB. Martaban hills, Yoonzeleen plateau, at 2500 ft. elevation (Dr. Brandis).

#### **Lobelia, L.**

##### **Conspectus of Species.**

*Small erect procumbent or creeping herbs. Flowers solitary or in spurious racemes, small, 1—4 lin. long.*

× Stems terete.

Calyx puberulous; flowers solitary, axillary, ..... *L. Zeylanica*.

× × Stems angular.

Stems 3-gonous; calyx quite glabrous; flowers solitary and axillary, or more usually in spurious racemes, ..... *L. trigona*.

Stems 4-gonous; flowers in poor racemes; calyx small, ..... *L. Griffithii*.

*Robust erect simple or branched herbs, 2—5 ft. high. Flowers  $\frac{1}{2}$ —1 in. long, in leafy-bracted terminal simple or paniced racemes.*

All parts, also the white corolla, quite glabrous; capsule glabrous, .... *L. Wallichiana*.  
All parts, also the rose-coloured corolla and the capsule, velvety puberulous, .. *L. rosea*.

1. *L. ZEYLANICA*, L. sp. pl. ed. 1. 932; Wall. in Roxb. Fl. Ind. II. 113.

Var. *α*. *GENUINA*, (*L. Lobbiana*, Hf. and Th. in Linn. Proc. II. 28), an aquatic form, the branches more or less ascending or erect, up to  $1\frac{1}{2}$  ft. long; all parts more robust; leaves up to 2 in. long; corolla 4—5 lin. long.

Var. *β*. *AFFINIS*, (*L. affinis*, Wall. Cat. 1311; DC. Prod. VII. 360; *L. succulenta*, Bl. Bydr. 728; DC. l. c. 373), creeping or prostrate, all parts smaller; leaves shorter petioled,  $\frac{1}{2}$ —1 in. long; corolla only 2 lin. long.

HAB. Var. *α* only, frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Fr. Febr., March.

2. *L. TRIGONA*, Roxb. Fl. Ind. ed. Wall. II. 111. (*L. subincisa*, Wall. Cat. 1310; DC. Prod. VII. 367; *L. subracemosa*, Miq. in Fl. Ind. Bat. II. 576).

Var. *α*. *TRIGONA*, (*L. trigona*, Roxb. l. c. etc.), all parts more succulent, the floral leaves more ovate; peduncles thicker and flowers much larger.

? Var. *β*. *STIPULARIS* (*L. stipularis*, Wall. Pl. As. rar. II. 43; *L. trialata*, Ham. in Don Prod. Fl. Nep. 157; DC. Prod. VII. 360; *L. micrantha*, Hook. Exot. Fl. I. t. 44?) slender, erect, branched, all parts less succulent; peduncles filiform; flowers minute, the floral bracts often very narrow. Probably a distinct species.

HAB. Frequent in swampy grass-land, borders of tanks, in wet paddy fields, and more especially on the banks of rivers, all over Burma; var. *β*. is a hill-form (or species?) of Martaban; also Prome, and Ava, on Taongdong.—Fl. Fr. Octob.—Dec.

Vatke (in Linnæa XXXVI. 718) identifies *L. trigona* of Roxburgh with *L. alsinoides* of Lamarck; the description of the latter, however, does not in the least agree with the Indian plant. *L. stipularis*, Wall., will take precedence, if it is not specifically different, but I am at present inclined to believe it may be different.

3. *L. GRIFFITHII*, Hf. and Th. in Linn. Proc. II. 28.

Var. *α*. *GENUINA*, leaves reduced to scales; flowers only a line long.

Var. *β*. *DOPATRIOIDES*, Kurz in Flora 1872. 302 (*L. dopatrioides*, Kurz in Journ. As. Soc. Beng. 1870. 77; *L. sp.* Griff. Not. Dicot. 281), leaves developed; flowers nearly twice the size.

HAB. In wet fields and swampy pastures of Pegu, near Rangoon (R. Scott); var. *β*. in long grass along rivers of Arracan, frequent; Tenasserim, Attaran (Brandis); Mergui (Griff.).—Fl. Fr. Octob.

4. *L. WALLICHIANA*, Hf. and Th. in Linn. Proc. II. 29 (*L. pyramidalis* var. *β*. DC. Prod. VII. 381).

HAB. Rare on wet sandstone-walls in the tropical forests of the Pegu Yomah; more frequent in the damp hill-forests and in open hill-pastures of the Martaban hills east of Tounghoo, also Ava, Khakyen hills.—Fl. Jan.—March; Fr. March, April.

5. *L. ROSEA*, Wall. in Roxb. Fl. Ind. ed. Wall. II. 115 and Plant. As. rar. II. 42. t. 152; DC. Prod. VII. 381. (*L. trichandra*, Wight Icon. t. 1171).

HAB. Martaban, Karennce hills (Revd. F. Mason); Ava, Khakyen hills (J. Anderson).—Fl. March.

#### *Scævola*, L.

##### *Conspectus of Species.*

Glabrous or silky-hairy, long silky villous in the leaf-axils; berries velvety or pubescent, ..... *S. sericea*.

Glabrous, not or slightly silky-villous in the leaf-axils; berries glabrous, .. *S. Kœnigii*.

1. *S. KœNIGII*, Vhl. Symb. III. 36; DC. Prod. VII. 505; Bot. Mag. t. 2732; Bth. Fl. Austr. IV. 86.—(*S. Tuccada*, Roxb. Fl. Ind. ed. Wall. II. 146; Wight Ill. t. 137; Griff. Not. Dicot. 275).

HAB. Frequent along the sea-coast, especially on coral-banks and beaches, of Tenasserim and the Andamans.

#### *STYLIDIEÆ.*

##### *Stylidium*, Swartz.

##### *Conspectus of Species.*

Leaves palmatinerved, almost rosulate, the stems terete; flowers white, in dichotomous leafless or few-leaved radical glandular-puberulous spikes or panicles, .. *S. uliginosum*.

Leaves 1-nerved, scattered, the stems angular; flowers rose-coloured, in a simple stiff glabrous spike, ..... *S. roseum*.

1. *S. ULIGINOSUM*, Swartz in Magaz. Nat. Gesch. Berl. 1807. 52. t. 2. f. 4; DC. Prod. VII. 336; Kurz in Flora 1872. 303.—(*S. Kunthii*, Wall. Cat. 3759; DC. Prod. VII. 335; *S. Brunonis*, Griff. Not. Dicot. 275; *S. tenellum*, Swartz Magaz. Naturf. Ges. Berl. 1807. 51. t. 2. f. 3; DC. Prod. VII. 336, a reduced state).

HAB. Frequent in swampy grass-lands, swamps, etc., of the alluvial and diluvial plains of Pegu; also Chittagong and Martaban down to Tenasserim as far south as Mergui.—Fl. Sept.—Nov.; Fr. Nov., Dec.

2. *S. ROSEUM*, Kurz in Journ. As. Soc. Beng. 1876. 137.—(*S. tenellum*, Kurz in Flora 1872. 304, non Sw.).

HAB. Swampy grass-land of Chittagong, rare.—Fl. Octob.

#### *VACCINIACEÆ.*

##### *Conspectus of Genera.*

##### *Calyx jointed with the pedicel.*

*VACCINIUM*. Calyx terete. Corolla various, from large and tubular and bell-shaped to small and urn-shaped. Anthers 8 or 10, the tubes short or long.

##### \* \* *Calyx continuous with the pedicel.*

*PENTAPTERYGIUM*. Calyx 5-winged. Rest as in *Vaccinium*.

**Vaccinium, L.****Conspectus of Species.**

*Subg. 1. Agapetes, Don.* Flowers large, rarely small; pedicels more than an inch long, thickened upwards and often cup-shaped-dilated at the apex. Epiphytical shrubs.

\* *Corolla large,  $\frac{1}{2}$ —2½ in. long, tubular to bell-shaped, slightly curved or straight.*

O Filaments more than  $\frac{1}{2}$  in. long.

Anthers short, connate; corolla tubular, slightly curved; racemes glabrous,

.. *V. macrostemon.*

O O Filaments thick and short, only 1—2 lin. long.

x Calyx and pedicels glandular-hirsute.

Corolla glabrous, tubular or campanulate-tubular; anthers without bristles between the tubes, ..... *V. verticillatum.*

x x Calyx and pedicels quite glabrous.

+ Anthers without a pair of reflexed or uncinat bristles between their tubes.

Anthers exserted; nerves of leaves uniting into a marginal nerve; corolla 2 in. long or longer, ..... *V. variegatum.*

As preceding, but corolla only  $\frac{1}{2}$  the size, scarlet, ..... *V. Roylei.*

Anthers included; nerves of leaves not uniting within the margin, ..... *V. miniatum.*

+ + Anthers with a pair of bristles between their tubes at the base or halfway up.

Corolla tubular bell-shaped; calyx-toothed, the teeth subulate-lanceolate,

.. *V. odontocentrum.*

Corolla bell-shaped, wide; calyx-limb cupular, with sinuate acute teeth,

.. *V. campanulatum.*

\* \* *Flowers rather small or small,  $\frac{1}{2}$  in. to 2 lin. only long, shortly or elongate-urn-shaped. (Corallobotrys, Hf.).*

Corolla  $\frac{1}{2}$  in. long, elongate-urceolate; flowers in peduncled terminal racemes,

.. *V. auriculatum.*

Corolla 2 lin. long, urn-shaped; flowers in short umbel-like racemes arising laterally from the branches, ..... *V. acuminatum.*

*Subg. 2. Epigynium, Klotsch.* Flowers small, urn-shaped or urceolate-campanulate; pedicels short, slender, not or only at the very joint thickened. Racemes one-sided. Berries globose.

\* *Epiphytical shrub. Bracts deciduous.*

Branchlets pubescent; corolla villous inside at the mouth; anthers with 2 bristles at the tubes, ..... *V. pumilum.*

\* \* *Terrestrial shrubs or trees. Bracts deciduous.*

All parts, also the pedicels, corolla, and calyx, glabrous, ..... *V. Donianum.*

Young shoots and racemes (sometimes also the calyx) pubescent; corolla glabrous,

.. *V. exaristatum.*

1. *V. MACROSTEMON*, Kurz in Journ. As. Soc. Beng. 1873. 85.

HAB. Not unfrequent in the hill-forests (especially the drier ones) of Martaban, at 4000 to 6000 ft. elevation.—Fl. March.

2. *V. VERTICILLATUM*, Kurz in Journ. As. Soc. Beng. 1873. 83, non Wight (*Agapetes verticillata*, D. Don Gen. Syst. III. 862; DC. Prod. VII. 554).

Var.  $\alpha$ . GENUINUM, (*Thibaudia obliqua*, Griff. Icon. Dicot. t. 515), corolla only  $\frac{1}{2}$  in. long; flowers in shortly peduncled umbel-like-racemes.

Var.  $\beta$ . ELEGANS, but the flowers solitary or by 2—3 in the axils of the leaves; leaves usually broader.

? Var.  $\gamma$ . GLANDIFLORUM, corolla  $1\frac{1}{2}$  in. long; flowers in short-peduncled or sessile umbel-like racemes, occasionally also solitary.

HAB. Var.  $\beta$ . in the upper dry forests on the Kambala ridges of the Pegu Yomah, at 2800 to 3000 ft. elevation; var.  $\gamma$  in the hill-forests of Martaban and Tenasserim as far south as Tavoy, at 4000 to 7000 ft. elevation.—Fl. March.

3. V. VARIEGATUM. Kurz in Journ. As. Soc. Beng. 1873. 84 (*Agapetes variegata*, Don Gen. Syst. III. 862; *Ceratostemma variegatum*, Roxb. Fl. Ind. II. 413; Griff. Icon. Dicot. t. 502; *Thibaudia macrantha*, Hook. Bot. Mag. t. 4566).

HAB. Moulmein, Kola mountains (Lobb).

4. V. ROYLEI (*Thibaudia variegata*, Royle Ill. Him. Pl. t. 79. f. 1; *V. variegatum*  $\beta$ . *parviflora*, Kurz in Journ. As. Soc. Beng. 1873. 84).

HAB. Frequent in the hill-forests of Martaban, at 3000 to 5000 ft. elevation.—Fl. March; Fr. April.

5. V. MINIATUM, Kurz in Journ. As. Soc. Beng. 1873. 85. (*Ceratostemma miniatum*, Griff. Icon. Dicot. t. 504).

HAB. Burma, probably Ava (Griff. 3475).

6. V. ODONTOCERUM, Wight Icon. t. 1187 (*Ceratostemma angulatum*, Griff. Dicot. Icon. t. 503).

HAB. Ava, Patkaye ranges (Griff.).—Fl. March.

7. V. CAMPANULATUM, Kurz in Journ. As. Soc. Beng. 1873. 85.

HAB. In the stunted hill-forests on the top of Nattoung, Martaban hills, at about 7000 ft. elevation.—Fl. March.

8. V. AURICULATUM (*Thibaudia auriculata*, Griff. Dicot. Icon. t. 508).

HAB. In the hill-forests on the Taipo mountains, Martaban, above 4000 ft. elevation, (Dr. Brandis).—Fl. March.

9. V. ACUMINATUM (*Agapetes acuminata*, D. Don Gen. Syst. III. 862; *Epigynium acuminatum*, Klotzsch in Linn. XXIV. 51; Bot. Mag. t. 5010; *Corallobotrys acuminata*, Hf. and Bth. Gen. pl. II. 575).

HAB. Burma, probably Moulmein hills (Griff. 3471).

10. V. PUMILUM, Kurz in Journ. As. Soc. Beng. 1873. 85.

? Var.  $\beta$ . CUNEATUM, leaves of thinner texture, obovate-cuneate to cuneate, rounded or blunt at the apex; flowers longer pedicelled.

HAB. Epiphytic in the drier hill-forests of the Martaban hills east of Tounghoo, at 5000 to 6000 ft. elevation; var.  $\beta$ . in the same forests on Taipo hill, at 4000 ft. elevation (Dr. Brandis).—Fl. March.

11. *V. DONIANUM*, Wight Icon. t. 1191; Walp. Ann. I. 478 (*Epigynium Donianum*, Klotzsch in Linn. XXIV. 51.; *V. affine*, Wight Icon. t. 1190).

Var. *a. GENUINUM*, anthers with a pair of bristles between the tubes; pedicels longer.

Var. *β. EXARISTATUM*, anthers without bristles; pedicels longer.

HAB. Frequent in the drier hill-, especially the pine-forests of the Martaban hills east of Tounghoo, at 3000 to 6000 ft. elevation.—Fl. Jan., Febr.; Fr. March.

12. *V. EXARISTATUM*, Kurz in Journ. As. Soc. Beng. 1873. 86.

HAB. Common in the drier hill-forests, especially the stunted ones, of Martaban, at 5000 to 6000 ft. elevation.—Fr. March.

Possibly only an exaristate form of *V. Leschenaultii*, Wight. *V. Malaccense*, one of this vicinity, differs in the puberulous corolla.

## ERICACEÆ.

### Conspectus of Genera.

*Trib. 1. ARBUTEÆ.* Corolla deciduous. Fruit a drupe or berry.

*PERNETTYA.* Corolla globular urn-shaped, the limb 5-toothed and reflexed. Stamens 10. Hypogynous scales 10, 3-lobed. Ovary 5-celled, the cells many-ovuled.

*Trib. 2. ERICEÆ.* Corolla deciduous or persistent. Fruit a capsule.

\* *Capsule loculicidally 5—6-valved.* (Andromedæ).

*GAULTHERIA.* Calyx 2-bracted at the base. Corolla urceolate, the revolute limb 5-cleft. Stamens 10; anthers 2-cleft, the cells terminating in 2 awns. Hypogynous scales 10, usually united at the base. Calyx fleshy or succulent in fruit.

*ANDROMEDA.* Corolla globular to tubular-urn-shaped, the reflexed limb 5-toothed. Stamens 10, included; anther-cells usually one-awned. Calyx open in bud; dry in fruit.

\* \* *Capsule dehiscent septically from the apex.* (Rhododendreæ).

*RHODODENDRON.* Corolla funnel- or bell-shaped, 5-cleft. Stamens 5 or 10, declinate; anthers opening by terminal pores. Capsule 5-celled.

### Gaultheria, L.

1. *G. PUNCTATA*, Bl. Bydr. 856; Miq. Fl. Ind. Bat. II. 1055.

Var. *a. BLUMEI*, leaves linear-oblong to oblong, very shortly petioled or almost sessile. A shrub, glabrous, the branchlets triquetrous.

? Var. *β. FRAGRANTISSIMA*, (*G. fragrantissima*, Wall. in Asiat. Res. XIII. 207. c. Icon.; Wight Icon. t. 1196; Bot. Mag. t. 5984), leaves obovate to obovate oblong and oblong, longer (up to  $\frac{3}{4}$  in.) or shorter petioled. A small bushy tree or at high elevations reduced to a shrub of a few feet in height, the branchlets triquetrous.

? Var. *γ. LESCHENAULTII*, (*G. Leschenaultii*, DC. Prod. VII. 593; Wight Icon. t. 1195 and Illustr. t. 141. C.; *Andromeda Kathagerensis*,

Hook. Icon. t. 246), branchlets more or less terete, covered with appressed blackish bristles; leaves often smaller, shortly petioled, the glands beneath often produced into appressed bristles. A shrub, large or often only  $\frac{1}{2}$  to a foot high.

HAB. Var.  $\beta$ . and  $\gamma$ . frequent in the drier hill-forests, especially the stunted ones, of the Martaban hills, at 6000 to 7000 ft. elevation.—Fl. Febr.; Fr. March.

The forms here brought together vary greatly in the length of the petiole, the pubescence of the corolla inside, size of plant, &c., and require further study.

### Andromeda, L.

1. A. OVALIFOLIA, Wall. Cat. 763 and in Asiat. Res. XIII. 391 cum icon.; Clegh. in Journ. Agr. Hort. Soc. Beng. XIV. 260. cum tab.; Wight Icon. t. 1199. (*Pieris ovalifolia*, Don. Gen. Syst. III. 832; DC. Prod. VII. 599; *A. lanceolata*, Wight Icon. t. 1198?).

HAB. Frequent in the drier hill-forests, especially the stunted ones and in the pine-forests, of Martaban, at 5000 to 7000 ft. elevation.—Fr. March.

### Rhododendron, L.

#### *Conspectus of Species.*

\* *Leaves shortly appressed tomentose or lepidote beneath. Calyx inconspicuous.*

Leaves beneath silvery and shortly tomentose beneath; ovary rusty puberulous; bracts of leaf-buds villous, ..... *R. arboreum*.  
Leaves beneath and ovary and style rusty lepidote; bracts of leaf-buds silky ciliate only, ..... *R. formosum*.

\* \* *Leaves glabrous and smooth.*

Ovary and style quite glabrous; bracts of leaf-buds ciliolate, ..... *R. Moulmeinense*.

1. R. ARBOREUM, Sm. Exot. Fl. t. 6; Bot. Reg. t. 890, 1240 and 1982; DC. Prod. VII. 720; Hook. Exot. Fl. t. 168; Bot. Mag. t. 3290; Houtt. Fl. d. serr. IX. t. 945; Wight Icon. t. 1201; Bedd. Fl. Sylv. Madr. t. 228.

HAB. In the hill-forests of the Karenee country (Rev. F. Mason).

2. R. FORMOSUM, Wall. Pl. As. rar. III. 3. t. 207; DC. Prod. VII. 721; Bot. Mag. t. 4457.

Var.  $\beta$ . VEITCHIANUM, (*R. Veitchianum*, Hook. Bot. Mag. t. 4992), flowers nearly twice the size; leaves not ciliate.

HAB. Martaban, not unfrequent on the top of Nattoung, at 7200 ft. elevation.—var.  $\beta$ . Moulmein hills.—Fl. March.

3. R. MOULMEINENSE, Hook. Bot. Mag. t. 4994.

HAB. Common in the hill-forests, especially the damper ones, from Martaban down to Tenasserim, at 4000 to 7000 ft. elevation.—Fl. March.

Near allied to *R. Javanicum*, from which it differs in its perfectly glabrous style and ovary and somewhat different nervation (the lateral nerves arising almost rectangularly from the midrib).

### EPACRIDÆ.

#### Leucopogon, R. Br.

1. *L. MALAYANUS*, Jack in Mal. Misc. I. No. 2 and in Hook. Bot. Misc. II. 71; Wall. in Roxb. Fl. Ind. II. 301; DC. Prod. VII. 744.

Var. *a. GENUINA*, leaves larger and broader,  $1\frac{1}{2}$  to 2 in. long, acute and mucronate; spikes about  $\frac{1}{2}$  in. long.

Var. *β. MOLUCCANUS*, (*L. Moluccanus*, Scheff. Obs. phytog. 97). leaves  $\frac{1}{2}$  to an in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  lin. broad, subulate-pointed; spikes only  $1\frac{1}{2}$ —2 lin. long.

HAB. Var. *a.* Burma, probably Tenasserim (Griff. 3453/1); var. *β.* Tenasserim (Helf. 3453).

### PLUMBAGINÆ.

#### Conspectus of Genera.

*Trib. 1. STATICEÆ.* Styles entirely, or at least at the summit free. Fruit an utricle bursting at the base or circumsciss at the top.

*ÆGIALITIS.* Styles glabrous, free; stigmas capitate. Petals coriaceous, jointed beyond the connate base; fruit elongate, exserted; albumen none. Treelets.

*Trib. 2. PLUMBAGINÆÆ.* Styles entirely connate. Pericarp more or less dehiscing into 2 valves.

*PLUMBAGO.* Calyx glandular-muricate. Fruit included in the calyx. Herbs.

#### Ægialitis, R. Br.

1. *Æ. ANNULATA*, R. Br. Prod. Nov. Holl. I. 426; DC. Prod. XII. 621. (*Æg. rotundifolia*, Roxb. Fl. Ind. II. 111; Griff. Not. Dicot. 207. t. 461. f. 2)..

HAB. Frequent in the littoral forests all along the shores from Chittagong down to Tenasserim and the Andamans.—Fl. Fr. CS.

#### Plumbago, L.

#### Conspectus of Species.

Spikes glandular-pubescent; corolla white; bract ovate, leafy; bractlets subulate,

.....*P. Zeylanica.*

Spikes glabrous or nearly so; corolla rose-coloured or scarlet; bract ovate-oblong, scarious, brown; bractlets conform with the bracts, .....*P. rosea.*

1. *P. ZEYLANICA*, L. sp. pl. 215; Roxb. Fl. Ind. I. 463; DC. Prod. XII. 692.

• HAB. In rubbishy places in and around villages, along river-banks and in toungyas, not unfrequent all over Burma, but apparently nowhere really wild.—Fl. Fr. ∞.

2. *P. ROSEA*, L. sp. pl. I. 215 ; Roxb. Fl. Ind. I. 463 ; Bot. Mag. t. 230 and t. 5363.—(*P. coccinea*, Boiss. in DC. Prod. XII. 693).

HAB. Not unfrequent in the moister mixed forests of the Pegu Yomah and the Martaban hills down to Tenasserim ; also Ava. Often cultivated and springing up in toungyas, along the river-banks, etc.—Fl. Fr. CS.

### PLANTAGINEÆ.

#### *Plantago*, L.

1. *P. MAJOR*, L. sp. pl. 163 ; Engl. Bot. t. 1558 ; Flor. Dan. t. 461 ; DC. Prod. XIII/1, 694.

Var.  $\beta$ . *ASIATICA*, Dene. in DC. Prod. XIII/1, 694 (*P. Asiatica*, L. sp. pl. 163 ; Wight Illustr. t. 177).

HAB. Ava, Khakyen hills (J. Anderson).

Endlicher places *Plantagineæ* near *Plumbagineæ*, and I believe this to be the true affinity, for, with the exception of the stamens being alternate with the petals, the characters are all reducible to the Plumbaginaceous type.

### PRIMULACEÆ.

#### *Conspectus of Genera.*

*Trib. 1. PRIMULÆ.* Capsule quite free (not adnate to the base of the calyx), dehiscent usually by longitudinal valves.

*PRIMULA.* Corolla salver- or funnel-shaped, furnished at the throat with 5 gibboso swellings. Capsule opening by 5-valves. Scapigerous annuals or perennials.

*LYSIMACHIA.* Corolla rotate or bell-shaped, with gibboso swellings at the throat. Capsule usually 5-valved. Erect or creeping simple or branched herbs. Flowers solitary and axillary, or in racemes or spikes.

*Trib. 2. ANAGALLIDÆ.* Capsule quite free, circumsciss-dehiscent.

*ANAGALLIS.* Corolla rotate or bell-shaped. Herbs with alternate or opposite leaves.

#### *Lysimachia*, L.

#### *Conspectus of Species.*

\* *Flowers solitary or by pairs in the leaf-axils.*

Glabrous ; stem erect, terete ; leaves linear ; flowers slenderly pedicelled,

.. *L. linearifolia*.

Glabrous, erect, the stem 4-cornered ; flowers slenderly pedicelled ; leaves lanceolate,

.. *L. peduncularis*.

\* \* *Flowers in terminal racemes.*

× All parts glabrous.

Stamens shorter than the petals, narrowly bordered, ..... *L. multiflora*.

Stamens exserted ; sepals broadly-white-bordered, ..... *L. lobelioides*.

× × Stems and racemes (glandular ?) hairy.

Habit of *L. lobelioides*, corolla twice the length of the calyx ; .... *L. Griffithiana*.

1. *L. LINEARIFOLIA*, Griff. in Journ. As. Soc. Beng. 1873. 86.

HAB. Burma, probably Ava (Griff. 3532).

2. *L. PEDUNCULARIS*, Wall. Cat 1489.

HAB. Ava, Taong-dong (Wall.) ; Tenasserim, Zwakabin (Rev. C. Parish).—Fl. Fr. Octob.

3. *L. MULTIFLORA*, Wall. Cat. 1487 ; DC. Prod. VIII. 63 ; Klatt, Gatt. Lysim. 14. t. 4.

HAB. Ava, near Bhamo (J. Anderson).—Fl. Febr.

4. *L. LOBELIOIDES*, Wall. in Roxb. Fl. Ind. II. 29 ; DC. Prod. VIII. 61 ; Bot. Reg. t. 6 ; Klatt, Gatt. Lysim. 16. t. 2.

HAB. Ava, Khakyen hills (J. Anderson).—Fl. May.

5. *L. GRIFFITHIANA*, Kurz in Journ. As. Soc. Beng. 1873. 86.

HAB. Ava, in fields towards Karmein.—Fl. April.

Apparently allied to the preceding species.

### MYRSINEÆ.

#### Conspectus of Genera.

*Subord. I EU-MYRSINEÆ.* Fruit an indehiscent berry or drupe. Seeds with albumen.

*Trib. 1. ARDISIÆ.* Staminodes none. Anthers not transversely chambered. Ovary inferior to superior.

\* *Ovary inferior or half-inferior.* (*Mæsa*).

*MÆSA.* Corolla bell-shaped or nearly so, imbricate in bud. Calyx 2-bracted. Drupe crowned by the calyx-limb, globular. Erect shrubs or trees.

\* \* *Ovary superior.* *Drapes globular.* (*Ardisiæ*).

× Flowers pedicelled, clustered, lateral or axillary.

*MYRSINE.* Corolla gamo- or rarely poly-petalous, imbricate or valvate. Flowers often polygamously dioecious. Ovules few. Erect trees or shrubs.

× × Flowers in racemes or panicles.

*SAMARA.* Corolla of 5 or 4 free petals imbricate in bud. Anthers as long as or shorter than the filaments. Ovules few. Climbers.

*ARDISIÆ.* Corolla gamopetalous, usually rotate, twisted in bud. Anthers longer than the filaments, free. Ovules numerous. Trees, shrubs, or undershrubs.

*Trib. 2. TEOPIRASTEÆ.* Staminodes 5, alternating with the stamens. (American).

*JACQUINTIA.* Corolla rotate-bell-shaped, deeply 5-cleft. Berry, few-seeded.

*Subord. II. ÆGICEREÆ.* Fruit a dry cylindrical follicle-like drupe rupturing irregularly. Seeds elongate, germinating while still on the tree. Albumen none. Anther-cells many-chambered.

*ÆGICERAS.* Corolla twisted in bud. Filaments connate at the base. Flowers in umbels. Trees.

### Mæsa, Forsk.

#### Conspectus of Species.

*All parts, also the inflorescence, quite glabrous.*

× Inflorescence very short (hardly as long as the petioles).

Branchlets verrucoso ; leaves minutely and remotely callus-toothed, .. *M. Andamanica*.

× × Inflorescence very much longer than the petioles.

† Leaves entire.

Racemes compound, shorter than the leaves, ..... *M. ramentacea*.

† † Leaves coarsely serrate.

Racemes compound, shorter than the leaves; calyx only  $\frac{1}{2}$  lin. long, ..... *M. Indica*.

Racemes compound, very slender, as long as or longer than the leaves; calyx nearly a line long, ..... *M. paniculata*.

\* \* Inflorescence, and more or less also the sinuate-toothed leaves and softer parts, pubescent or otherwise hairy.

Leaves softly pubescent, especially beneath; panicles or racemes dense, rusty pubescent, shorter than the petiole; bracts minute, ..... *M. mollissima*.

Leaves glabrous, midrib beneath sparingly hairy; panicles densely rusty-hairy and mossy, much longer than the petioles; bracts about as long as the pedicels,

.. *M. muscosa*.

1. *M. ANDAMANICA*, Kurz For. Fl. Burm. II. 575. (*M. verrucosa*, Kurz For. Fl. Burm. II. 98, non Scheff.).

HAB. In the tropical forests of South Andaman.—Fl. May, June.

2. *M. RAMENTACEA*, Roxb. Fl. Ind. I. 230; DC. Prod. VIII. 77; Miq. Fl. Ind. Bat. II. 1006; Scheff. Comment. Myrsin. 15. (*M. glabra*, Roxb. Fl. Ind. I. 560; *M. Sumatrana*, Scheff. l. c.).

HAB. Common in the tropical and moister mixed forests, all over Burma, from Chittagong and Ava down to Tenasserim and the Andamans, up to 2000 ft. elevation; freely springing up in deserted toungyas.—Fl. Jan.; Fr. March, April.

3. *M. INDICA*, DC. in Linn. Trans. XVII. 134; DC. Prod. VIII. 80; Miq. Fl. Ind. Bat. II. 1008. (*Bæobotrys Indica*, Roxb. Fl. Ind. I. 557; Wight Icon. t. 1206).

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and more so in those from Martaban down to Tenasserim up to 3000 ft. elevation; Chittagong; Ava, Khakycen hills.—Fl. March.

4. *M. PANICULATA*, A. DC. in Linn. Trans. XVII. 133 and Prod. VIII. 78. (*M. montana*  $\beta$ . *elongata*, DC. Prod. VIII. 79?).

HAB. Tenasserim (Helf. 3559); Tavoy (Wall.).—Fl. Dec.

5. *M. MOLLISSIMA*, A. DC. Prod. VIII. 81. (*M. mollis*, A. DC. l. c. 82; *M. permollis*, Kurz in Journ. As. Soc. Beng. 1871. 66, forma latifolia).

HAB. Rather frequent in the tropical forests of the eastern slopes of the Pegu Yomah and more so from Martaban down to Upper Tenasserim, Thoungyeen (Brandis); Ava, Khakycen hills.—Fl. March, April.

6. *M. MUSCOSA*, Kurz in Journ. As. Soc. Beng. 1873. 87..

HAB. Burma, probably Ava (Griff. 3556).

### Myrsine, L.

#### Conspectus of Species.

\* *Stigma* 2—3-lobed, usually fringed.

× Style longer or shorter. Leaves more or less serrate, especially towards the apex.

Podicels slender and stiff, 3—5 lin. long, ..... *M. Khasyana*.

Podicels thick, 1—2½ lin. long, ..... *M. semiserrata*.

× × Stigmas almost sessile. Leaves entire.

Leaves exactly those of *M. capitellata*; pedicels thick, shorter than the flower or drupe; stigmas small, ..... *M. avenis*.

\* \* Stigma simple, linear and usually thick. Leaves entire.

Flowers almost sessile or shortly pedicelled, densely clustered; lateral nerves thin but usually distinct, ..... *M. capitellata*.

1. *M. SEMISERRATA*, Wall. in Roxb. Fl. Ind. II. 294 (1824) and Flor. Nep. Tent. 34. t. 24; DC. Prod. VIII. 93. (*M. subspinoea*, Don Prod. Nep. 147 (1825 ?); DC. Prod. VIII. 94 ?).

HAB. Not unfrequent in the hill-forests of Martaban east of Tounghoo, above 6000 ft. elevation.—Fl. Fr. March.

I am not sure about the plant which Wallich figures in his Tent. Nepal; but as all the specimens of Wallich's Herbarium seen by me belong to the short-pedicelled form, I have followed DC. and others in regarding them the same. But there is a form common in the Khasi hills (apparently restricted to this locality) which has very slender, long, and stiff pedicels and this I am inclined to treat as a distinct species (*M. Khasyana*).

2. *M. AVENIS*, DC. in Linn. Trans. XVII. 108. and Prod. VIII. 96; Scheff. Comm. Myrs. 47. (*Ardisia avenis*, Bl. Bydr. 691).

HAB. Not unfrequent in the drier hill-forests of Martaban east of Tounghoo, at 4000 to 7000 ft. elevation.—Fl. March.

I am not sure whether the Burmese tree is Blume's species, which I have not seen. Scheffer's *M. avenis*, from Banca, is hardly the same as Blume's.

3. *M. CAPITELLATA*, Wall. in Roxb. Fl. Ind. II. 295 and Tent. Fl. Nepal. 35. t. 24; Bot. Mag. t. 3222; Wight Icon. t. 1211; DC. Prod. VIII. 95; Bedd. Fl. Sylv. t. 234. *M. lucida*, Wall. Cat. 2298; DC. Prod. VIII. 95.

HAB. Not unfrequent in the eng-forests of the Prome District; Ava, Taong-dong (Wall.); Martaban, Nattoung hills (Rev. Mason).\*

Of this species there are two forms, or more likely two distinct species,—the genuine one, represented also in Burma, which has clustered sessile or almost sessile flowers, and the nerves of which are thin but pretty distinct,—and the pedicellate form, the flowers of which rest on short thick pedicels, and this also has the lateral nerves very obsolete.

Samara, L. (1767).

(*Embelia*, Burm. 1768.)

*Conspectus of Species.*

*Inflorescence terminal, or terminal and axillary. Filaments short and thick.*

× Leaves softly pubescent.

Inflorescence brown puberulous; pedicels capillary, ..... *S. microcalyx*.

× × Leaves glabrous.

Branchlets and inflorescence greyish or tawny velvety or puberulous; pedicels toroto,

... *S. Ribes*.

As preceding, but the velvety pubescence always greyish; flowers sessile, *S. sessiliflora*.

All parts, also the inflorescence, quite glabrous; pedicels 4-cornered, .... *S. floribunda*.

\* \* Inflorescences axillary only. Filaments longer than the anthers, slender and filiform. Young shoots more or less pubescent.

× Leaves beneath more or less pubescent (at least the nerves). Flowers 5-merous.

† Leaves on long petioles.

Leaves 3—5 in. long; racemes elongate; pedicels short, .... *S. robusta*.

Leaves 2—2½ in. long; racemes short; pedicels very long and slender, .... *S. vestita*.

† † Leaves almost sessile.

Leaves ½—1 in. long, distichous, not pellucid-dotted, only the midrib puberulous; racemes very short and almost umbel-like, .... *S. parviflora*.

× × Leaves quite glabrous. Flowers 4-merous.

Leaves ½—1 in. long, serrately 3-toothed at the apex, conspicuously gland-dotted beneath; racemes very short and almost umbel-like, .... *S. Myrtillus*.

1. *S. RIBES*, Bth. and Hf. (*Embelia Ribes*, Burm. Fl. Ind. 62. t. 23; DC. Prod. VIII. 85; Roxb. Fl. Ind. I. 586; Scheff. Comm. Myrs. 38; *Embelia* sp. Griff. Not. Dicot. 293 ?).

Var. *a. GENUINA*, leaves destitute of hollow glands; flowers racemose, in panicles.

Var. *β. GLANDULIFERA*, (*Embelia glandulifera*, Wight Icon. t. 1207; Walp. Ann. I. 494), leaves with many or only few hollow glands along or near the midrib; flowers often in simple axillary racemes, only those at the ends of the branchlets panicle.

HAB. Var. *a* frequent in the tropical forests of Martaban and Tenasserim; also Chittagong.—Fr. March.

2. *S. SESSILIFLORA*, (*Embelia sessiliflora*, Kurz in Journ. As. Soc. Beng. 1871. 66).

HAB. Burma, probably Karen hills.

Probably only a sessile-flowered variety of the preceding species.

3. *S. FLORIBUNDA*, Bth. and Hf. (*Embelia floribunda*, Wall. in Roxb. Fl. Ind. II. 291; DC. Prod. VIII. 85; *Embelia garciniæfolia*, Miq. Pl. Jungh. 187; Scheff. Comm. Myrs. 40).

HAB. Not unfrequent in the stunted hill-forests of the Nattoung, Martaban, at 6000—7200 ft. elevation.—Fl. March.

4. *S. ROBUSTA*, Bth. and Hf. (*Embelia robusta*, Roxb. Fl. Ind. I. 587; DC. Prod. VIII. 86; *Embelia picta*, DC. l. c.).

Var. *a. ROXBURGHII*, Kurz For. Fl. Burm. II. 103.

Var. *β. VILLOSA*, Kurz l. c. (*Embelia villosa*, Wall. in Roxb. Fl. Ind. II. 289; DC. Prod. VIII. 85; *Embelia ferruginea*, Wall. ap. DC. Prod. l. c. 86).

HAB. Only var.  $\beta$ . but this form common in the upper mixed forests, all over the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Aug., Sept.; Fr. Jan., Febr.

The extreme forms of *Embelia robusta*, and *E. villosa*, look very different, but they offer no characters for a safe distinction. The length of the pedicels and of the bracts and the thickness of the rachis of the racemes vary as much as the indumentum. The striæ on the drupes of *E. robusta* are not always present.

5. S. VESTITA, Bth. and Hf. (*Embelia vestita*, Roxb. Fl. Ind. ed. Wall. II. 288; DC. Prod. VIII. 88; *Embelia nutans*, Wall. l. c. 290).

HAB. Rather rare in the tropical forests, especially along choughs, of the Pegu Yomah.

6. S. PARVIFLORA, (*Embelia parviflora*, Wall. Cat. 2307; DC. Prod. VIII. 86; Scheff. Comm. Myrs. 44).

HAB. Ava (Griff. 3545); Khakyen hills (J. Anderson).—Fl. March.

7. S. MYRTILLUS, (*Myrsine Myrtillus*, Hook. Icon. t. 825; Walp. Ann. V. 473; *Embelia Myrtillus*, Kurz in Journ. As. Soc. Beng. 1871. 67).

HAB. Burma (Griff. 3542).

### Ardisia, Sw.

#### Conspectus of Species.

*Panicles irregularly branched and compound, terminal, or accompanied by smaller ones in the axils of the upper leaves.*

+ Pedicels much shorter than the calyx, or the flowers almost sessile.

Leaves entire; panicle stiff and stout, rusty puberulous; calyx-lobes acute, .. *A. rigida*.

× × Pedicels much longer than the calyx.

+ Leaves entire.

Leaves coriaceous, decurrent on the strong petiole, the nerves arising at an acute angle; panicle glabrous or nearly so, ample; peduncle angular, ..... *A. paniculata*.

Leaves almost chartaceous, not decurrent, the nerves diverging almost rectangularly, numerous; panicle slightly puberulous; peduncle compressed, ..... *A. anceps*.

Leaves chartaceous; panicles rusty-puberulous, chiefly from the axils of the upper leaves; calyx-lobes lanceolate, ..... *A. nerifolia*.

+ Leaves serrulate.

Habit of the preceding; calyx-lobes linear, ..... *A. serrulata*.

\* \* Flowers in racemes often contracted umbel-like, rarely the racemes or umbels simply compound, axillary, lateral or axillary and terminal.

× Umbels in small axillary corymbs or cymes. (*Pimelandra*, DC.)

Nearly glabrous; leaves thin coriaceous; flowers minute; cymes rusty velvety, of the length of the petiole, ..... *A. eugeniaefolia*.

× × Umbels or racemes simple or compound.

+ Umbels forming a simple terminal panicle.

Very like *A. attenuata*, but umbels panicled; leaves much dotted; pedicels  $\frac{1}{2}$ —1 in. long, ..... *A. Andamanica*.

† † Umbels or racemes simple, very rarely slightly compound, axillary or lateral, rarely spuriously terminal, i. e. arising laterally from the summit of an axillary shoot.

O Leaves entire.

† Calyx-lobes acute or acuminato, lanceolate or narrow.

Racemes almost terminal, umbel-like, puberulous, ..... *A. grandifolia*.

† † Calyx-lobes broad, rounded or blunt.

Δ Young shoots, and often also the inflorescence or under surface of leaves, puberulous or pilose.

Pedicels 8—10 lin. long, recurved; calyx-lobes a line long, ..... *A. Amherstiana*.

Δ Δ Quite glabrous.

Pedicels  $\frac{1}{2}$  in. long; leaves 5—10 in. long, obovate-lanceolate, ..... *A. polyccephala*.

Pedicels about an inch long.

Leaves 3—5 in. long; corolla-lobes nearly  $2\frac{1}{2}$  lin. long, ..... *A. oblonga*.

Leaves 3—5 in. long, obovate-lanceolate, the lateral nerves rather distant, thin but strong, irregular, ..... *A. humilis*.

Very similar to the above but the leaves more coriaceous, the lateral nerves rather crowded, straight, thin and often obsolete, ..... *A. littoralis*.

O O Leaves more or less serrate or crenate (at least towards the apex).

† Inflorescence peduncled, simple.

Δ Calyx-lobes bluntish.

Glabrous or the young shoots and slender-bracted racemes puberulous; leaves acute,

.. *A. Wallichii*.

Glabrous; leaves blunt; racemes umbel-like, puberulous or glabrous, somewhat shorter than the leaves, ..... *A. Brandisiana*.

Δ Δ Calyx-lobes acute.

Rusty tomentose or pubescent; leaves acuminate, ..... *A. Helferiana*.

† † Racemes peduncled, simply compound.

Habit of *A. crispa*, but leaves larger and green, callous-repand-toothed, conspicuously gland-dotted beneath; pedicels up to  $\frac{1}{2}$  in. long; berries the size of a pea, striate,

.. *A. membranacea*.

Very similar to the above, but racemes divaricately corymbose and spuriously terminal; pedicels up to 2 in. .... *A. virens*.

† † † Inflorescence umbellate, sessile, or at least the primary racemes sessile and the lateral ones peduncled.

Umbels sessile, like the leaves glabrous; calyx-lobes a line long, ..... *A. crispa*.

Leaves beneath and the sessile umbels brownish or rusty tomentose; calyx-lobes  $2\frac{1}{2}$  lin. long, ..... *A. villosa*.

1. *A. RIGIDA*, Kurz in Journ. As. Soc. Beng. 1873. 87.

HAB. Tenasserim (or Andamans) (Helf. 3563).

N. B. *Ardisia chrysophylloides*, Miq. = *A. tuberculata*, Wall.

2. *A. PANICULATA*, Roxb. Fl. Ind. I. 580; DC. Prod. VIII. 126;

Bot. Reg. t. 638; Bot. Mag. t. 2364.

HAB. Hilly parts of Chittagong (Roxb.).

3. *A. ANCEPS*, Wull. in Roxb. Fl. Ind. II. 280; DC. Prod. VIII.

127. (*A. Blumei*, DC. in Linn. Trans. XVII. 117 and Prod. VIII. 128, teste Scheffer).

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim, up to 3000 ft. elevation.—Fr. Febr.—May.

Scheffer attributes black berries to the Blumean species, while the Roxburghian has them white when fully ripe.

4. *A. NERIIFOLIA*, Wall. ap. DC. Prod. VIII. 127.

HAB. Burmah (Griff. 3581), probably Ava hills.

5. *A. SERRULATA*, Kurz in Journ. As. Soc. Beng. 1873. 87.

HAB. Burmah (Griff. 3562), probably Ava hills.

6. *A. EUGENIÆFOLIA*, Wall. Cat. 2276; DC. in Linn. Trans. XVII. 120 and Prod. VIII. 130.

HAB. Burmah (Griff. 3598, with smaller flowers); Martaban, Taipo Mountains, at 4000 ft. elevation.—Fl. Febr.

7. *A. ANDAMANICA*, Kurz For. Fl. Burm. II. 108.

HAB. Not unfrequent in the tropical forests of the Andaman islands.—Fl. June.

So very near to *A. oblonga*, DC., that the inflorescence only distinguishes it.

8. *A. GRANDIFOLIA*, DC. in Linn. Trans. XVII. 122 and Prod. VIII. 132.

HAB. Tenasserim, Tavoy.

Unknown to me.

9. *A. AMHERSTIANA*, DC. in Linn. Trans. XVII. 120 and Prod. VIII. 131.

HAB. Pegu, near Rangoon (Cleghorn); Tenasserim, apparently frequent around Moulmein (Wall., Falconer).—Fl. March; Fr. Febr., March.

N. B. *A. reflexa*, Wall. Cat. 2282. p. p.; DC. in Linn. Trans. XVII. 122, and Prod. VIII. 132, is a species unknown to me and comes from Tenasserim. The description does not point out differences from the preceding species.

10. *A. POLYCEPHALA*, Wall. Cat. 2293; DC. in Linn. Trans. XVII. 118 and Prod. VIII. 131.

Var. *β*. *ACUMINATA*, leaves acuminate, the nerves strong and anastomosing within the margin of the leaves. Probably a distinct species.

HAB. Tenasserim, Salween river above Murgyee, near the large mount (Wall.; Hef.); var. *β*. frequent in the tropical forests all along the eastern slopes of the Pegu Yomah and in those of Martaban.—Fl. Fr. March—May.

N. B. *A. arborescens* (Wall. Cat. 2289; DC. in Linn. Trans. XVII. 120 and Prod. VIII. 131, from Taong-dong, Ava), is unknown to me.

11. *A. OBLONGA*, A. DC. in Linn. Trans. XVII. 121 and Prod. VIII. 131.

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim; also Andamans.—Fl. June; Fr. Sept.—March.

N. B. *A. attenuata*, Wall. Cat. 2286 p. p.; DC. in Linn. Trans. XVII. 119 and Prod. VIII. 131 from Tavoy, is unknown to me but apparently not different from the above.

12. *A. HUMILIS*, Vahl Symb. Bot. III. 40 (1794); DC. Prod. VIII. 129; Wight Icon. t. 1212.—(*A. solanacea*, Roxb. Corom. Pl. I. 27. t. 27 and Fl. Ind. I. 580; Bot. Mag. t. 1677; *A. elliptica*, Thbg. Nov. gen. pt. 8. (1795) ?)

HAB. Frequent in the tropical forests of the Pegu Yomah, Arracan and Martaban.—Fl. March—April; Fr. Octob.

13. *A. LITTORALIS*, Andr. Repos. X. t. 630 (1804).—(*A. obovata*, Bl. Bydr. 688; DC. Prod. VIII. 132; *A. umbellata*, Roxb. Fl. Ind. I. 582 (ed. prior II. 273); *Climacandra obovata*, Miq. Pl. Jungh. I. 199 and Fl. Ind. Bat. II. 1030; Scheff. Comm. Myrs. 95; *Climacandra umbellata*, Miq. l. c.; *Climacandra littoralis*, Kurz in Journ. As. Soc. Beng. 1871. 68).

HAB. In the beach-jungles and along the sea-coasts of Tenasserim and the Andamans.—Fl. May, June.

14. *A. WALLICHII*, DC. in Linn. Trans. XVII. 123 and Prod. 137.

Var. *a. GENUINA*, the young shoots and inflorescence covered with a rusty-brown floccose-pilose pubescence, the net-venation more copious and more prominent, the dots more conspicuous.

Var. *β. GLABRUSCULA*, young shoots glabrous; inflorescence and pedicels indistinctly puberulous; net-venation almost obsolete.

HAB. Frequent all over Pegu and Martaban down to Tenasserim; var. *a.* in the low and eng-forests; var. *β.* chiefly in the mixed forests. Fl. Fr. Sept.—Jan., chiefly April, May.

15. *A. BRANDISIANA*, Kurz in Journ. As. Soc. Beng. 1871. 67.

HAB. Martaban, Salween, along a choung near T'oumbjotseik, below 500 ft. elevation, (Dr. Brandis).—Fl. May.

16. *A. HELFERIANA*, Kurz in Journ. As. Soc. Beng. 1873. 86.

HAB. Tenasserim (Helf. 3589).

17. *A. VIRENS*, Kurz For. Fl. Burm. II. 575.

HAB. Ava, Khakyen hills (J. Anderson).

Leaves and inflorescence very like those of *Amblyanthus glandulosus*.

18. *A. CRISPA*, DC. in Linn. Trans. XVII. 127 and Prod. VIII. 134. (*Bladhia crispa*, Thbg. Fl. Jap. 97 ?; *A. crenulata*, Lodd. Bot. Cab. t. 2., non Vent.; *A. crenata*, Bot. Mag. t. 1950; Roxb. Fl. Ind. I. 583, in icone ined. flores flavescentes depicti; *A. lentiginosa*, Bot. Reg. t. 553; *A. densa*, Miq. Suppl. Fl. Sum. 575; *A. macrocarpa*, Wall. in Roxb. Fl.

Ind. II. 271 ; DC. Prod. VIII. 134 ; *A. polysticta*, Miq. Suppl. Fl. Sumatr. I. 576 ; Scheff. Comm. Myrs. 75, *sepalis acutis*).

HAB. Not unfrequent in the damp hill-forests of the Martaban hills, at 4000—7000 ft. elevation ; Burmah, probably Ava (Griff. 3583/1).—Fl. —Fr. March.

Thunberg's species has not only a different nervature but is characterised also by the numerous conspicuous gland-dots. Khasi specimens (Hb. Hf. and Th. No. 41), however seem identical with the Japan plant.

19. *A. VILLOSA*, Roxb. Fl. Ind. I. 582 ; DC. Prod. VIII. 136.—(*A. mollis*, Bl. Bydr. 689 ; *A. villosa*,  $\beta$ . *mollis*, DC. l. c. ; Scheff. Comm. Myrs. 90 ; *A. vestita*, Wall. in Roxb. Fl. Ind. II. 274 ; DC. l. c.)

Var. *a.* ROXBURGHIANA, leaves more or less rusty pubescent, at least on the nerves.

Var. *\beta*. GLABRATA, (*A. glabrata*, Bl. Bydr. 692 ; DC. Prod. VIII. 136), leaves glabrous at least when full-grown ; calyx glabrous or nearly so.

HAB. Var. *a.* only, Martaban, Taipo mountain, at 4000 ft. elevation (Dr. Brandis) ; Tenasserim, Tavoy (Wall.).—Fl. Sept., Octob. ; Fr. Oct.—Febr.

### *Ægiceras*, Gærtn.

1. *Æ. CORNICULATA*, Blanco Fl. Filip. 79. (*Rhizophora corniculata*, L. sp. pl. 635 ; Rheed. Hort. Malab. VI. t. 36 ; *Æ. majus*, Gærtn. Fruct. I. 216. t. 46. f. 1 ; DC. Prod. VIII. 142 ; Roxb. Fl. Ind. III. 130 ; Scheff. Comm. Myrs. 97 ; *Æ. minus*, Gærtn. ; DC. l. c. ; *Æ. fragrans*, Kæn. Ann. Bot. I. 129 ; Hook. Bot. Misc. III. 84. t. 21 ; Griff. Not. Dicot. 294. t. 548. f. a.).

HAB. Frequent in the mangrove and tidal forests all along the coasts, from Chittagong down to Tenasserim and the Andamans.—Fl. Febr., March.

### SAPOTACEÆ.

#### *Conspectus of Genera.*

*Trib. 1. Isomeri.* Calyx-lobes equal in number to the corolla-lobes.

\* *Calyx-segments uniseriate.*

× Stamines entirely absent.

CHRYSOPHYLLUM. Flowers 5-, rarely 6—7-merous, with as many ovary-cells and stamens.

× \* × Stamines as many as stamens and usually alternating with them.

SIDEROXYLON. Flowers 5-merous. Ovary-cells 5—2. Stamens 5. Seeds albuminous.

SARCOSPERMA. Flowers 5-merous. Stamens and ovary-cells 5 each. Seeds without albumen. Stipules caducous.

\* \* *Calyx-segments in 2 distinct series.*

× Stamens as many as petals and alternating with as many staminodes

ACHNAS. Flowers 6-merous. Stamens 6. Ovary-cells 12.

× × Stamens twice as many as petals, or numerous. Staminodes none.

ISONANDRA. Flowers 4-merous. Stamens 8. Seeds with albumen. Ovary-cells 4.

DICHOPSIS. Flowers 6-merous. Stamens 12. Albumen none. Ovary-cells 6.

Trib. 2. *Anisomeri*. Corolla-lobes usually 2—3 times as many as calyx-lobes.

\* *Staminodes none*.

× Ovary-cells twice as many as calyx-segments.

HEXAMERIA. Calyx-lobes 6. Corolla-lobes and stamens each 12. Ovary-cells 12.

PAYENA. Calyx-lobes 4. Corolla-lobes, stamens, and ovary-cells 8 each.

× × Ovary-cells as many as calyx-segments.

BASSIA. Calyx-lobes and ovary-cells 4 or 6; corolla-lobes 8—14. Stamens about 2 or 3 times as many as corolla-lobes, in 1—3 series.

\* \* *Staminodes* 6 or 8.

MIMUSORS. Calyx-lobes and ovary-cells 6 or 8 each; corolla-lobes 2 or 3 times as many.

### Chrysophyllum, L.

1. CH. ROXBURGHII, G. Don in Mill. Dict. IV. 33; Bedd. Sylv. Madr. t. 236. (*Ch. acuminatum*, Roxb. Fl. Ind. I. 599, non Lamk.; *Ch. Sumatranum*, Miq. Suppl. Fl. Sumatr. 579.)

HAB. Rather rare in the tropical forests above Rangoon, Pegu.—Fl. June; Fr. Dec.

### Sideroxylon, L.

#### Conspectus of Species.

*Subg. 1. Oligotheca*, DC. Calyx-lobes acuminate or acute. Young shoots and under-surface of leaves more or less villous-tomentose.

Armed with long solitary supra-axillary spines; calyx-lobes acute, . . . . . *S. armatum*.

Unarmed; calyx-lobes acuminate, . . . . . *S. tomentosum*.

*Subg. 2. Eu-Sideroxylon*. Calyx-lobes rounded or blunt.

\* *Berries* 1—2-seeded.

Younger parts coppery or rusty-silk hairy; leaves coriaceous, . . . . . *S. attenuatum*.

\* \* *Berries* several (5—10)-seeded.

Glabrous; leaves chartaceous, . . . . . *S. grandifolium*.

1. *S. TOMENTOSUM*, Roxb. Corom. Pl. I. 28. t. 28 and Fl. Ind. I. 602. (*Sapot? tomentosa*, DC. Prod. VIII. 175).

Var. *β. SPINESCENS*, the younger branchlets armed with short sharp spines in the leaf-axils.

HAB. Not unfrequent in the eng and dry forests of Prome; var. *β.* Pegu, more probably Prome (Dr. Brandis).

I have only leaf-specimens, and the identification is, therefore, somewhat doubtful.

2. *S. ? PARVIFOLIUM*, Kurz For. Fl. Burm. II. 576 (*Mimusops parvifolia*, Kurz For. Fl. Burm. II. 123, excl. flor.)

HAB. Rather rare in the eng-forests of Prome; Ava, below Yenang-choung (Wall. Cat. 4146 G.).

Very like *S. elengoides*. It is rather a small tree, spiny armed, but Wallich's incomplete specimen (although doubtless identical) is unarmed. The flowers (loose) attached to Wallich's specimen resemble those of *Mimusops littoralis*, and I now entertain little doubt that they do not belong at all to the leaf-specimens.

3. *S. ATTENUATUM*, DC. Prod. VIII. 178; Wight Icon. t. 1590; Miq. Fl. Ind. Bat. II. 1037.

HAB. Tropical forests of Tenasserim, from Moulmein (Falconer) down to Mergui (Helfer, Giff., etc.); also Andamans, Narcondam island.—Fl. March.

4. *S. GRANDIFOLIUM*, Wall. in Roxb. Fl. Ind. II. 349; DC. Prod. VIII. 178.—(*S. regium*, Wall. Cat. 4156).

HAB. Martaban, hill-ranges between the Beeling and Sittang (Dr. Brandis); Pegu (Wall.); tropical forests of the Andamans.—Fl. April; Fr. Febr., March.

The seeds of this species are albuminous.

#### **Sarcosperma, Hf.**

1. *S. ARBOREUM*, Hf. in Bth. Gen. Pl. II. 655. (*Sideroxylon arbo-  
reum*, Ham.; *Sapotea*, Griff. Not. Dicot. 291. t. 501).

HAB. Upper Burma, Namyoon (Griff.).

#### **Achras, L.**

\*1. *A. SAPOTA*, L. sp. pl. 470; Jacq. Amer. 57. t. 41; Bot. Mag. t. 3111—12; Roxb. Fl. Ind. II. 181.—(*Sapota Achras*, Mill. Dict. No. 1.; DC. Prod. VIII. 174; Miq. Fl. Ind. Bat. II. 1036).

HAB. Of American origin, now frequently planted along roads at Rangoon and other larger stations.—Fl. RS.

#### **Isonandra, Wight.**

##### *Conspectus of Species.*

*Subg. 1. Eu-Isonandra.* Flowers 4-merous. Seeds albuminous.

*Subg. 2. Apobassia*, DC. Flowers 4- or 6-merous. Seeds without albumen.

\* *Flowers 4-merous.*

Leaves chartaceous, strongly nerved, ..... *I. caloneura*.

\* \* *Calyx 6-parted, the 3 outer segments valvate* (Dichopsis, Thw.).

Leaves coriaceous, glaucous beneath, the nerves obsolete; filaments as long as the anthers, densely villous, ..... *I. polyantha*.

Leaves coriaceous, glaucous beneath, the nerves strong and parallel; filaments long and slender, ..... *I. obovata*.

1. *I. CALONEURA*, Kurz in Journ. As. Soc. Beng. 1871. 69 and 1873. 88 (*calophylla*).—(*Bassia caloneura*, Kurz in Andam. Rep. 41).

HAB. Not unfrequent in the tropical forests of the Andamans.—Fr. May.

*Dichopsis* and *Isonandra* differ in the number of floral parts and in the absence or presence of a rather scanty albumen. This species, however, has 4-merous flowers and no albumen, and hence I fear that the character derived from the albumen is of the same value as in *Linociera*, etc., amongst *Oleaceae*.

2. I. POLYANTHA. (*Bassia polyantha*, Wall. Cat. 4166; DC. Prod. VIII. 198; *Dichopsis polyantha*, Bth. and Hf. Gen. pl. II. 658).

HAB. Tropical forests of Boronga-island, near Akyab, Arracan, at 500—1000 ft. elevation.

There is another *Isonandra* in HBC. in leaf only, from Martaban, Mittigate (Falconer), with large chartaceous strongly parallel-nerved leaves glaucous beneath. It seems very near allied to the above.

3. I. OBOVATA, Griff. Not. Dicot. 293. (*Bassia* ? *hypoleuca*, Miq. Suppl. Fl. Sumatr. 582).

HAB. Tenasserim (Griff., Helfer); Moulmein (Falconer).—Fr. March.

### Payena, A. DC.

#### Conspectus of Species.

Subg. 1. *HEXAMERIA*, Griff. Calyx 6-parted.

Filaments very short, villous; anthers glabrous, mucronate-acuminate, ....? *Griffithii*.

Subg. 2. *EU-PAYENA*. Calyx 4-parted.

\* *Anthers pilose* (*Ceratophorus*, Hassk.).

\* \* *Anthers glabrous*.

Connective of anthers produced into a broad blunt beak; sepals blunt or nearly so; nerves somewhat irregular; petiole about  $\frac{1}{4}$ — $\frac{1}{2}$  in. long, ..... *P. lucida*.

Connective terminating in a bristle; sepals acute; nerves thin, parallel; petiole about an in. long, slender, ..... *P. paralleleoneura*.

1. *P. LUCIDA*, DC. Prod. VIII. 197; Miq. Fl. Ind. Bat. I. 1039. —(*Ceratophorus Wightii*, Hassk. Retz. I. 601; Miq. Fl. Ind. Bat. I. 1039; *Isonandra polyandra*, Wight Icon. t. 1589).

HAB. Burma (rather Malacca?) (Griff. 3605).

2. *P. PARALLELEONEURA*, Kurz in Journ. As. Soc. Beng. 1871. 70.

HAB. Frequent in the tropical forests of Martaban down to Tenasserim (Helf. 3611).—Fl. March; Fr. April, May.

### *Bassia*, Koen.

(*Dasyaulus*, Thw.; *Kakosmanthos*, Hassk.)<sup>1</sup>

#### Conspectus of Species.

\* *Anthers aristate, included, on very short filaments or almost sessile*.

Corolla-lobes very short (about  $\frac{1}{4}$  as long as the tube); anthers in 3 rows; berries obovate-oblong, ..... *B. latifolia*.

Corolla-lobes as long as the tube; anthers in 2 rows; berries unknown, .... *B. villosa*.

\* \* *Anthers blunt, on long slender filaments and exserted*.

Corolla-lobes as long as the tube; anthers in a single row inserted at the throat; berries ovate, acuminate, ..... *B. butyracea*.

1. *B. VILLOSA*, Wall. Cat. 4165; DC. Prod. VIII. 198.

HAB. Ava, Taong-dong (Wall.).—Fl. Nov.

### **Mimusojs, L.**

#### *Conspectus of Species.*

Leaves rounded or retuse; flowers solitary, rather small; anthers blunt (?); berries the size and shape of a wood-apple, 5—6-seeded, ..... *M. littoralis*.

Leaves bluntish acuminate or apiculate; flowers clustered, conspicuous; anthers very acuminate; berries oval, usually 1-seeded, ..... *M. Elengi*.

1. *M. LITTORALIS*, Kurz in Journ. As. Soc. Beng. 1876. 138. (*M. Indica*, Kurz Andam. Rep. 42 and in Journ. As. Soc. 1871. 70).

HAB. Frequent in the coast-forests of the Andamans; also Tenasserim, Moulmein (Wallich, Theobald) and further south (Griff. 3613).—Fl. June, July; Fr. CS.

2. *M. ELENGI*, L. sp. pl. 497; DC. Prod. VIII. 202; Roxb. Corom. Pl. I. 15. t. 14. and Fl. Ind. II. 236; Miq. Fl. Ind. Bat. II. 1042; Wight Icon. t. 1586; Bedd. Sylv. Madr. t. 40).

HAB. Not unfrequent in the tropical forests of South Andaman, also in those of Martaban and Tenasserim; generally planted in villages all over Burmah.—Fl. Febr.—Sept.

### **EBENACEÆ.**

#### *Conspectus of Genera.*

\* *Ovary-cells with 2 ovules.*

MARA. Calyx- and corolla-lobes usually trimerous. Ovary-cells usually as many as corolla-lobes.

CARGILIA. Calyx and corolla 4—6-merous. Ovary-cells usually twice as many as corolla-lobes.

*Ovary-cells 1-ovuled.*

× Anthers opening by longitudinal slits.

GUNISANTHUS. Calyx- and corolla-lobes usually 4, rarely 6. Ovary-cells usually as many. Male and female flowers all solitary. Calyx of males divided to the base, the lobes narrow, membranous.

DIOSPYROS. Calyx- and corolla-lobes usually 4—6. Male flowers clustered or cymose, the females solitary, or rarely in cymes or panicles. Calyx of males gamosepalous.

× \* Anthers opening laterally by apical pores.

LEUCOXYLON. Characters of *Diospyros*.

### **Maba, Forst.**

#### *Conspectus of Species.*

*Ovary 6-celled, the cells 1-ovuled.*

Glabrous or nearly so; ovary glabrous, ..... *M. Merguensis*.

\* \* *Ovary 3-celled, densely pubescent.*

Leaves small, glabrous ; berries globular, the size of a pea, ..... *M. buxifolia*.  
 Leaves large, hirsute along the nerves beneath ; berries oblong, more than an inch long,  
 .. *M. Andamanica*.

1. *M. MERGUIENSIS*, Hiern Monog. Ebenac. 134.

HAB. Tenasserim, Mergui Archipelago (Helf. and Griff. 3618).—Fl. Jan. ; Fr. Febr.

I separate the species with 1-ovulate and 2-ovulate ovary-cells, and from this point of view the above species, which has 1-ovulate ovary-cells apparently twice as numerous as the floral parts, cannot be a true *Maba*, but may be referable to *Diospyros*. I have seen no specimens of it.

2. *M. BUXIFOLIA*, Pers. Ench. II. 606 ; DC. Prod. VIII. 240 ; Miq. Fl. Ind. Bat. II. 1050 ; Wight Icon. t. 763 ; Hiern Monog. Eben. 116 ; Bedd. Fl. Sylv. Madr. 148. t. 19. f. 4. (*Ferreola buxifolia*, Roxb. Corom. Pl. I. 35. t. 45. and Fl. Ind. III. 790 ; *M. Neilgherrensis*, Wight Illust. t. 148 bis ; *M. Ebenus*, Wight Icon. t. 1228—9).

HAB. Tenasserim, from Moulmein southwards (Griff., Wall., Falconer).—Fl. Febr., March.

3. *M. ANDAMANICA*, Kurz in Journ. As. Soc. Beng. 1876. 138. (*Macreightia Andamanica*, Kurz And. Rep. 42 ; Hiern Monogr. Ebenac. 124).

HAB. Frequent in the moister upper mixed forests of the Andamans.—Fl. RS. ; Fr. April.

**Gunisanthus, DC.**

*Conspectus of Species.*

Not flowering branchlets sparingly pubescent ; leaves glabrescent ; calyx-tube half the length of the corolla-lobes, ..... *G. pilosulus*.

Not flowering branchlets densely villous ; leaves beneath permanently softly pubescent ; calyx-tube a little shorter than the corolla-lobes, ..... *G. mollis*.

1. *G. PILOSUS*, DC. Prod. VIII. 220.—(*Diospyros pilosulus*, Wall. Cat. 4132 ; Hiern Monog. Eben. 188).

HAB. Not unfrequent in the tropical forests of the Andamans ; also in those of the Pegu Yomah.—Fl. April ; Fr. May, June.

2. *G. MOLLIS*, Kurz in Journ. As. Soc. Beng. 1873. 88.

HAB. Not unfrequent along chouns in the tropical forests of Martaban east of Tounghoo.—Fl. March.

Very near allied to the preceding species.

**Diospyros. L.**

*Conspectus of Species.*

*Subg. 1. AMUXIS*, Hiern. Calyx in bud globular and closed, the lobes connate but afterwards bursting irregularly into 2 or 3 lobes. Corolla tubular, 5-lobed. Ovary-cells as many as corolla-lobes.

Glabrous; leaves coriaceous and elegantly net-veined; corolla conspicuous, about 4 lin. long, very coriaceous. .... *D. Toposia*.

Subg. 2. *EU-DIOSPYROS*, DC. Calyx toothed or lobed, rarely truncate.

Ovary-cells often twice as many as corolla-lobes.

\* Calyx in males short and truncate-toothed, in females large, deeply lobed; corolla urceolate, the lobes notched; anthers 30—50.

Glabrous; leaves coriaceous, .... *D. Embryopteris*.

\* \* Calyx toothed or lobed; corolla-lobes not notched; anthers about 20 or fewer.

× Corolla urceolate, in bud globular or conical, the tube short and inflated, the lobes usually rounded and short.

+ Flower-buds globular; corolla quite glabrous; flowers small, hardly a line long.

Leaves thin chartaceous, with strong prominent nerves, the net-venation distinct, lax; ovary glabrous, .... *D. chartacea*.

Leaves thin-coriaceous, the nerves strong, the net-venation inconspicuous; ovary tawny villous, .... *D. chretioides*.

+ + Flower-buds conical, acute, but never elongate.

† Ovary pubescent or villous. Leaves quite glabrous and glossy.

Flowers rather large, clustered, from the older branches, .... *D. ramiflora*.

Leaves glaucous-green when dry, almost polished, the nerves very inconspicuous and impressed; peduncles 4—5 lin. long; nearly 5—6 lin. long, axillary, ... *D. oleifolia*.

† † Ovary glabrous or nearly so.

‡ Leaves more or less rigid, quite glabrous, glossy.

Leaves drying blackish, the nerves and net-venation thin but prominent; flowers small axillary, the males cymose; berries globose, the size of a cherry; albumen homogeneous, .... *D. Kurzii*.

‡ ‡ Leaves membranous, at least while somewhat young more or less puberulous or pubescent.

O Berries sessile or nearly so.

Calyx-lobes of males acute; leaves more or less acuminate; berries the size of a cherry; albumen homogeneous, .... *D. mollis*.

Calyx-lobes blunt; leaves acute or apiculate; berries 2 or 3 times as large, .... *D. Kaki*.

O O Berry rather long-peduncled.

Leaves glaucouscent, glabrescent; berries the size of a cherry; albumen homogeneous; spiny-armed tree, .... *D. montana*.

Leaves pubescent beneath; berries about an in. in diameter; albumen ruminate on the outer face; unarmed tree, peduncles shorter and stout, .... (*D. cordifolia* ?)

× × Corolla salver-shaped, elongately (very rarely shortly) conical, the tube not or hardly widened, the lobes as long or nearly as long as the tube.

• † Borders of the calyx-lobes of female flowers reflexed or revolute, at least at the base, and often appearing somewhat auricled.

† Corolla in bud short-conical. (*Otogyne*, DC.).

All younger parts tawny or grayish tomentose; leaves coriaceous, glabrescent above; flowers usually ♂ (4—6)-merous; albumen ruminate, .... *D. Burmanica*.

Slightly appressed pubescent; leaves thin chartaceous; flowers 4-merous; calyx-lobes silky-pubescent, especially inside; ovary densely fulvous-tomentose, ... *D. rhodocalyx*.

† † Corolla in bud elongate conical, 4-angular. Flowers 4-merous.

O Flowers (both sexes) forming tomentose bracted usually compound cymes. Berries globular.

Peduncles long, the cyme often compound; net-venation of leaves obsolete, *D. densiflora*. Cymes large, corymb-like, fuliginous-velvety; net-venation strong but lax, *D. Horsfieldii*.

O O Flowers short-peduncled or sessile, axillary.

Flowers short-peduncled, clustered; net-venation indistinct; berries obovate,

... *D. flavicans*.

Flowers sessile or nearly so; net-venation lax but distinct; berries globular, rusty-pubescent; albumen homogeneous, ..... *D. undulata*.

As preceding, but ovary glabrous, ..... *D. sapotoides*.

+ + Borders of the calyx-lobes in female flowers plain, not reflexed nor recurved.

† All parts, except the very young shoots, quite glabrous. Flowers almost sessile.

Flowers rusty-tomentose; calyx short, the lobes acute; leaves strongly net-veined; berries tawny-tomentose; corolla 4-cornered in bud, . . . . . *D. lanceecfolia*.

Male calyx bell-shaped, the lobes short, rounded, tomentose; leaves strongly net-veined berries rusty-tomentose; corolla terete in bud, ..... *D. pyrrocarpa*.

Calyx ample, puberulous, the lobes rounded; male cymes very short and stout; leaves; strongly net-veined; corolla terete in bud, ..... *D. variegata*.

† † All parts, especially the leaves, more or less pubescent or otherwise hairy; male flowers in cymes; berries glabrous.

Leaves not cordate, softly pubescent beneath; calyx-lobes and bracts acute; flowers 4-merous, ..... *D. stricta*.

Leaves not cordate, adult almost glabrous and chartaceous; calyx-lobes linear-lanceolate; cymes branched, arising from the stem and older branches; flowers 5-merous,

... *D. Brandisiana*.

Leaves with cordate base, softly pubescent; calyx-lobes and bracts rounded; cymes short, stout; flowers 4-merous, ..... *D. dasyphylla*.

1. *D. TOPOSIA*, Ham. in Linn. Trans. XV. 115; Bedd. Icon. plant. t. 122; DC. Prod. VIII. 237; Hiern Monogr. Ebenac. 263.—(*D. racemosa*, Roxb. Fl. Ind. II. 536; DC. Prod. VIII. 239; Wight Icon. t. 416).

HAB. Chittagong.

2. *D. EMBRYOPTERIS*, Pers. Ench. II. 624; Bot. Reg. VI. t. 499; DC. Prod. VIII. 235; Griff. Not. Diot. 289; Hiern Monogr. Eben. 257; Bedd. Sylv. Madr. t. 69. (*Embryopteris glutinifera*, Roxb. Corom. Pl. I. 49. t. 70; Wight Icon. t. 843—44; *D. glutinosa*, Koen. ap. Roxb. Fl. Ind. II. 533).

HAB. Martaban and Tenasserim, apparently not unfrequent; often cultivated in villages.—Fl. Aug.; Fr. Febr.—April.

3. *D. CHARTACEA*, Wall. Cat. 4135; DC. Prod. VIII. 232; Hiern Monogr. Ebenac. 230.

HAB. Not uncommon in the tropical forests of Martaban and Upper Tenasserim.—Fl. March, April.

4. *D. EHRETIODES*, Wall. Cat. 4137; DC. Prod. VIII. 231; Hiern Monogr. Eben. 162.

HAB. Frequent in all leaf-shedding, especially the mixed forests, all over Burmah, from Ava and Martaban down to Pegu, up to 3000 ft. elevation.—Fl. April, May; Fr. Decb., Jan.

5. *D. RAMIFLORA*, Roxb. Fl. Ind. II. 535; DC. Prod. VIII. 233; Wight Icon. t. 189; Hiern Monogr. Eben. 235.

HAB. Rather rare in the tropical forests of Arracan; also Chittagong.

6. *D. OLEIFOLIA*, Wall. Cat. 4128; Kurz in Journ. As. Soc. Beng. 1871, 72; Hiern Monogr. Eben. 204.

HAB. Frequent in the tropical forests of Martaban and Upper Tenasserim.—Fl. March; April; Fr. RS.

7. *D. KURZII*, Hiern Monogr. Ebenac. 162.

HAB. Frequent in the tropical and moister upper mixed forests of the Andamans.—Fl. May, June; Fr. Febr.—April.

8. *D. MOLLIS*, Griff. in Journ. Agr. Hort. Soc. Beng. III. 145. c. icon.

HAB. Frequent in the drier hill-forests of Martaban, at 2—4000 ft. elevation; Ava, Khakyen hills.—Fl. March.

9. *D. MONTANA*, Roxb. Corom. Pl. I. 37. t. 48; DC. Prod. VIII. 230; Wight Icon. t. 1225 and Illustr. t. 148; Hiern Monogr. Eben. 220.

Var. *a. GENUINA*, Hiern l. c. 222. (*D. heterophylla*, Wall. ap. DC. Prod. VIII. 230, teste Hiern).

Var. *β. CORDIFOLIA*, Hiern l. c. 222. (*D. cordifolia*, Roxb. Corom. Pl. I. 38. t. 50 and Fl. Ind. II. 538; DC. Prod. VIII. 230; Wight Illustr. t. 148; *D. punctata*, Dene. Hb. Timor. Deser. 79; DC. l. c.; Miq. Fl. Ind. Bat. II. 1046; *D. Waldemarii*, Klotzsch in Waldem. Reise 101. t. 55).

HAB. Frequent in all leaf-shedding forests, especially the dry and eng-forests, of Ava, Prome, and Pegu.—Fl. April, March; Fr. Decb.—Febr.

A variety of this (in the analytical key separated as *D. cordifolia*?) is frequent in the mixed forests of Pegu. It has the leaves much larger (3—4 in. long), but offers (in fruit only) no tangible characters for specific separation. I rely upon the rumination of seeds as little in *Diospyros* as in *Calumaea*.

10. *D. BURMANICA*, Kurz in Journ. As. Soc. Beng. 1871. 73; Hiern Monogr. Ebenac. 166.

HAB. Common in the dry and open, especially the eng-forests of Prome and Ava; less frequent in those of Pegu and Martaban.—Fl. March, April; Fr. Dec., Jan.

11. *D. RHODOCALYX*, Kurz in Journ. As. Soc. Beng. 1871. 71; Hiern Monogr. Eben. 241.

HAB. Siamese provinces of Radburi and Kanburi (Teysmann).—Fl. HS.

Habit and affinity of *D. chloroxylon*,

12. *D. DENSIFLORA*, Wall. Cat. 4140; DC. Prod. VIII. 233; Hiern Monogr. Eben. 171.

HAB. Rather rare in the tropical forests of Arracan and Martaban; also Tenasserim.—Fl. Febr.; Fr. March.

13. *D. HORSFIELDII*, Hiern Monogr. Eben. 193.

HAB. Tenasserim (Helf. 3620), *teste* Hiern.

14. *D. FLAVICANS*, Hiern Monogr. Eben. 205 (*Ebenacea* 2, Griff. Not. Dicot. 291.)

HAB. Tenasserim (Helfer 3623 and 3639, 3640).

Helfer's No. 3632 (not seen by me) from Tenasserim or the Andamans is referred by Hiern to *D. Moonii*, Thw. (*D. hirsuta*, L.). I fear there is a mistake.

15. *D. UNDULATA*, Wall. Cat. 4136; DC. Prod. VIII. 233; Hiern Monogr. Ebenac. 216.

HAB. Not unfrequent in the tropical forests of Martaban, Tenasserim and the Andamans.—Fr. April, May; Fr. Octob.—Febr.

16. *D. SAPOTOIDES*, Kurz in Journ. As. Soc. Beng. 1873 88.; Hiern Monogr. Ebenac. 206.

HAB. Frequent in the tropical forests of the eastern slopes of the Pegu Yomah (especially along the Choungmench choung, Khaboung).—Fl. April.

17. *D. LANCEFOLIA*, Roxb. Fl. Ind. II. 537; DC. Prod. VIII. 232; Hiern Monogr. Ebenac. 213.

HAB. Upper Tenasserim, Moulmein (Falconer).—Fl. March.

18. *D. PYREHOCARPA*, Miq. Suppl. Fl. Sumatr. 583; Hiern Monogr. Eben. 266.

? Var.  $\beta$ . *ANDAMANICA*, leaves oblong to narrow-oblong, the lateral nerves faint and numerous, net-venation more lax.

HAB. Var.  $\beta$ . Rather rare in the tropical forests of the Andamans.—Fl. May.

The Andaman tree, I have little doubt, is a different species, but the material is too incomplete for description.

19. *D. VARIEGATA*, Kurz in Journ. As. Soc. Beng. 1871. 73; Hiern Monogr. Eben. 203.

HAB. Not unfrequent in the moister upper mixed and the tropical forests of Pegu and Martaban, up to 1000 ft. elevation.—Fl. April.

20. *D. STRICTA*, Roxb. Fl. Ind. II. 539; DC. Prod. VIII. 232, Hiern Monogr. Eben. 201.

HAB. Chittagong (Hf. and Th.); Tipperah (Roxburgh).

21. *D. BRANDISIANA*, Kurz in Journ. As. Soc. Beng. 1871. 72; Hiern Monogr. Eben. 184.

HAB. Upper Tenasserim, Domdamee forests (Brandis); Ava, Kha-kyen hills (J. Anderson).—Fl. Febr., March.

22. D. *DASYPHYLLA*, Kurz in Journ. As. Soc. Beng. 1871. 71; Hiern Monogr. Eben. 203.

HAB. Martaban, Taëpo hills, at 4000 ft. elevation (Brandis).

### STYRACEÆ.

#### Conspectus of Genera.

STYRAX. Calyx somewhat enlarging and enclosing the fruit for one half. Corolla slightly twisted or almost valvate in bud. Stamens 10, the anthers elongate. Drupe dry, sometimes valvately dehiscent.

SYMPLOCOS. Calyx wholly or nearly wholly adnate to the ovary. Corolla-lobes imbricate in bud. Stamens numerous, indefinite, the anthers short. Drupe more or less succulent, crowded by the calyx-limb.

### Styrax, L.

#### Conspectus of Species.

\* *All parts more or less tomentose, the under-surface of the leaves particularly so.* Leaves white-tomentose beneath; calyx slit spatho-like, conspicuously subulate-toothed, ..... *S. rugosum*.

\* \* \* *Younger parts more or less tomentose; leaves sparingly and minutely stellate-puberulous, glabrescent and green.*

• Calyx 5- or 6-toothed; corolla-lobes narrow-oblong, about 4 lin. long; leaves serrulate. .... *S. serrulatum*.

Calyx truncate and minutely toothed; corolla-lobes ovate, nearly  $\frac{1}{2}$  in. long; leaves remotely and minutely toothed, ..... *S. virgatum*.

1. *S. RUGOSUM*, Kurz in Journ. As. Soc. Beng. 1871. 61.

HAB. Martaban, on the hills between the Sittang and Salween, at 4000 ft. elevation (Dr. Brandis).—Fl. May.

2. *S. SERRULATUM*, Roxb. Fl. Ind. II. 415; DC. Prod. VIII. 267; Bot. Mag: t. 5950. (*S. floribunda*, Griff. Not. Dicot. 287 ?)

HAB. Chittagong (Roxb.); Ava, Khakyen hills (J. Anderson); (Tenasserim, between Kulweng and Mergui, Griff.)—Fl. March; Fr. Octob.

3. *S. VIRGATUM*, Wall. Cat. 4100; DC. Prod. VIII. 267.—(*S. grandiflorum*, Griff. Not. Dicot. 287. t. 423).

HAB. Burmah (Griff. 3671), probably Ava.

### Symplocos, L.

#### Conspectus of Species.

*Ovary 3-celled. Drupes oblong or elliptical, 3-celled. Embryo straight.*

× Drupes salcate-ribbed.

Young parts more, or less rusty-pubescent; flowers sessile or nearly so, in simple tomentose spikes, ..... *S. sulcata*.

× × Drupes smooth and terete.

† Racemes or spikes not glabrous.

- Glabrous ; flowers sessile, in compound puberulous spikes, ..... *S. lucida*.  
 Young shoots more or less pubescent ; flowers shortly pedicelled, in simple or branched  
 villous-tomentose racemes, ..... *S. racemosa*.  
 † † Racemes quite glabrous.
- Glabrous ; petioles and rib beneath sparingly hairy ; racemes slender, .. *S. leiostachya*.  
 \* \* Ovary 2- rarely 3-celled. Drupes more or less turbinate or obversely pear-  
 shaped, by abortion usually 1-seeded, the endocarp often intruding so as to  
 cause the seed to be more or less curved. Embryo curved.  
 × Stamens in 2 or more series, not fascicled.  
 † Flowers sessile, in simple or compound spikes.  
 O Drupes ribbed or torulose.
- Young shoots, spikes, and leaves beneath more or less rusty pubescent or tomentose ;  
 drupes ribbed, ..... *S. javanica*.
- Glabrous ; spikes glabrous ; drupes torulose-ribbed, ..... *S. spicata*.  
 O O Drupes terete and smooth.
- Glabrous, also the spikes ; drupes ovoid-turbinate, ..... *S. polycarpa*.  
 † † Flowers pedicelled, in simple or compound racemes. Drupes  
 terete.
- Glabrous ; racemes compound, minutely appressed pubescent, stout ; drupes ovoid-  
 turbinate (unripe), ..... *S. pedicellata*.
- Glabrous ; leaves caudate acuminate ; racemes simple, slender, pubescent ; drupes  
 ovoid-turbinate, ..... *S. laudata*.  
 × × Stamens collected into 5 bundles. Flowers white.
- Racemes shortly tomentose, short ; pedicels very short and thick, ..... *S. leucantha*.  
 Racemes appressed pubescent, forming slender panicles ; pedicels long, filiform,  
 ..... *S. cratægoides*.

1. *S. SULCATA*, Kurz in Journ. As. Soc. Beng. 1871. 65.

Var. *a. GLABRIOR*, leaves more coriaceous, quite glabrous and shining above ; drupes larger and glabrous.

Var. *β. PUBESCENS*, leaves narrower and longer acuminate, less glossy and almost opaque, pubescent on the midrib beneath ; young shoots rusty villous-tomentose ; drupes (unripe) pubescent.

HAB. Not rare in the drier hill-forests of Martaban, at 3000 to 6000 feet elevation ; var. *β.* Upper Tenasserim, Daunat pass, 4000 ft. (Dr. Brandis).—Fr. March.

2. *S. LUCIDA*, Wall. Cat. 4414 ; DC. Prod. VIII. 255.

HAB. Not unfrequent in the hill-forests of Martaban, especially on the Nattoung ridges, at 5—7000 ft. elevation.—Fl. March.

3. *S. RACEMOSA*, Roxb. Fl. Ind. II. 539 ; DC. Prod. VIII. 255. (*S. Hamiltoniana*, Wall. Cat. 4420 ; DC. l. c. 254).

Var. *a. ROXBURGHIANA*, racemes usually simple or nearly so, leaves quite glabrous (*S. rigida*, Wall. Cat. 4422), or the midrib beneath slightly appressed pubescent.

Var. *β. COMPOSITA*, racemes more or less branched ; leaves glabrous.

HAB. Rather frequent in the open and dry forests, all over Ava and

Pegu down to Martaban and Upper Tenasserim, up to 2000 ft. elevation.—Fl. Jan., Febr.

4. *S. LEOSTACHYA*, Kurz in Journ. As. Soc. Beng. 1873. 89. and in Trim. Journ. Bot. 1875. 329.

HAB. Tenasserim (Helf. 3656).

5. *S. JAVANICA*, (*Dicalyx Javanicus*, Bl. Bydr. 1117; *S. ferruginea*, Roxb. Fl. Ind. II. 542; DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I/2. 466; *S. rubiginosa*, Wall. ap. DC. l. c.; *S. Horsfieldiana*, Miq. Suppl. Fl. Sumatr. 475, auctore ipso "foliis latioribus" tantum differt).

HAB. Tenasserim (Helf. 3645).

6. *S. SPICATA*, Roxb. Fl. Ind. II. 541; DC. Prod. VIII. 254, non Bth. Fl. Austr.

HAB. Tenasserim (Helf. 3660 and 3664), from Moulmein southwards.—Fl. Aug.

If *Myrtus laurina*, Retz. Obs. IV. 27, is really the same as Roxburgh's plant, the specific name will have to be changed in favour of Retz's.

7. *S. POLYCARPA*, Wall. Cat. 4423 A. and B.; DC. Prod. VIII. 255. (*S. attenuata*, Wall. Cat. 4426; DC. l. c. 256).

HAB. Frequent in the hill-forests of Martaban, especially Nattoung ridges, Taipo &c., at 4—5000 ft. elevation; Tenasserim, from Moulmein (Falconer) to Tavoy (Wall.).—Fl. Febr., Aug.

8. *S. PEDICELLATA*, Kurz in Journ. As. Soc. Beng. 1873. 89.

HAB. Rare in the tropical forests of Toukyeghat east of Tounghoo, Martaban.—Fr. April, May.

9. *S. CAUDATA*, Wall. Cat. 4413; DC. Prod. VIII. 256.

HAB. Chittagong (Hf. and Th.); Upper Tenasserim, Taoo road (Dr. Brandis).—Fr. April.

10. *S. LEUCANTHA*, Kurz in Journ. As. Soc. Beng. 1873. 89.

HAB. Frequent in the swamp-forests between the Irrawaddi and Lheing rivers of Pegu.—Fl. Jan

11. *S. CRATEGOIDES*, D. Don. Fl. Napal. 145; DC. Prod. VIII. 258.

HAB. Martaban, Nattoung hills (Rev. F. Mason).

## OLEACEÆ.

### Conspectus of Genera.

*Subord. I. OLEACEÆ.* Stamens 2 only, situated between a pair of corolla-lobes.

*Trib. 1. JASMINEÆ.* Corolla-limb 5—12-lobed. Ovules erect.

\* *Fruit a dry compressed capsule.*

*NYCTANTHES.* Corolla twisted in bud. Albumen none. Scabrous trees, with simple leaves.

\* \* *Fruit a 2- or by abortion 1-lobed drupe.*

**JASMINUM.** Corolla twisted in bud. Albumen none. Shrubs, usually scandent, rarely trees; leaves simple or compound.

*Trib. 2. OLEEÆ.* Corolla 4-lobed, rarely 6—8-cleft or wanting, with or without a tube. Ovules pendulous or attached laterally near the summit of the cell.

\* *Corolla-lobes twisted in bud. Ovules pendulous. Fruit a dry capsule or samara.*

**SCHREBERA.** Corolla salver-shaped. Ovary 2-celled, with 3—4 ovules in each cell. Capsule 2-valved. Seeds winged. Albumen none. Trees or shrubs, the leaves pinnate or rarely simple.

\* \* *Corolla lobes valvate in bud or nearly so, rarely imbricate. Fruit drupaceous or berry-like. Leaves simple.*

× Corolla-lobes more or less imbricate.

**OSMANTHUS.** Corolla-lobes blunt. Endocarp of drupes thin. Flowers clustered, axillary.

× × Corolla-lobes induplicate-valvate.

**CHIONANTHUS.** Petals usually elongate, free or very shortly united at the base. Seeds with or without albumen. Trees; inflorescence various.

**OLEA.** Ovary-cells 2-ovuled. Seeds albuminous. Panicles axillary or terminal. Trees or shrubs, erect.

**MYXOPYRUM.** Flowers minute, in axillary panicles. Seeds albuminous. Woody climber, with sharply 4-cornered branches.

*Subord. II. SALVADORACEÆ.* Corolla 4-parted, without tube. Stamens 4, alternating with the corolla-lobes. Ovules erect.

**AZIMA.** Petals free, linear. Stamens free. Ovary 2-celled, the cells 2-ovuled. Shrubs, spiny armed.

### Nyctanthes, L.

1. **N. ARBOR TRISTIS**, L. sp. pl. ed. 2. 8; Roxb. Fl. Ind. I. 86; Bot. Reg. t. 399; DC. Prod. VIII. 314; Bot. Mag. t. 4900; Bedd. Sylv. Madr. t. 240.

**HAB.** Rare in the low forests above Rangoon; Ava, Irrawaddi valley (J. Anderson); Tenasserim (Helf. 3697) cult. ?—Fl. Fr. US.

### Jasminum, L.

#### Conspectus of Species.

*Ser. 1. Unifoliolate.* Leaves simple, with a jointed petiole.

\* Bracts minute or short and filiform, rarely wanting.

× Calyx-lobes short, or the calyx almost truncate.

+ Flowers corymbose.

Glabrous; pedicels 2—5 lin. long; calyx 5-cornered, almost truncate, ..... *J. extensum*.  
Pubescent; flowers sessile; calyx-teeth as long as the calyx-tube, ..... *J. decussatum*.

+ + Flowers in poor axillary racemes; pedicels  $\frac{1}{2}$ —1. long; calyx-teeth distinct.

+ Corolla-lobes blunt, glabrous.

Nerves conspicuous on both sides, usually with a gland in the axils; corolla-lobes usually 8, rarely 6—7, ..... *J. subglandulosum*.

Nerves thin and obsolete, without glands; corolla-lobes usually 5, ..... *J. attenuatum*.

+ + Corolla-lobes acuminate.

Glabrous ; leaves more or less narrow, very long acuminate ; corolla-lobes 9—12,

.. *J. laurifolium*.

× × Calyx-lobes longer than the calyx-tube, subulate.

Small shrub, almost erect ; branchlets puberulous ; leaves penninerved, .... *J. Sambac*.

Twining, glabrous ; leaves 3-nerved, ..... *J. anastomosans*.

\* \* Bracts leafy, conspicuous, shorter or longer than the calyx.

× Bracts longer than the calyx, leafy, white-discoloured.

More or less pubescent, especially the branchlets ; corolla-tube about  $\frac{1}{2}$  in. long or longer, ..... *J. Rottlerianum*.

Glabrous when adult, tufted-hairy in the nerve-axils beneath ; corolla-tube about an in. long, ..... *J. coarctatum*.

× × Bracts shorter than the calyx ; calyx-lobes subulate ; pedicels 1—2 lin. long.

More or less pubescent ; corolla- and calyx-lobes each 6—9, the latter 4—5 lin. long, pubescent, ..... *J. hirsutum*.

Glabrous or puberulous ; corolla- and calyx-lobes each 6—7, the latter only a line long, more or less pubescent, ..... *J. scandens*.

*Ser. 2. Foliolata.* Leaves unpaired-pinnate or pinnately 3-foliolate, rarely occasionally 1-foliolate.

Glabrous ; leaves unpaired-pinnate ; calyx-lobes subulate, about 3—4 lin. long,

.. *J. grandifolium*.

1. *J. EXTENSUM*, Wall. Cat. 2862 ; DC. Prod. VIII. 308.

HAB. Ava, towards the base of the Taong-dong (Wall.).—Fl. Fr.

Nov.

2. *J. DECUSSATUM*, Wall. Cat. 2860 ; DC. Prod. VIII. 306.

HAB. Not unfrequent in the tropical forests, from Martaban down to Upper Tenasserim, up to 3000 ft. elevation.—Fl. Febr. ; Fr. March.

3. *J. SUBGLANDULOSUM*, Kurz in Trim. Journ. Bot. 1875. 329, and For. Fl. Burm. II. 151.

HAB. Not unfrequent in the tropical forests of the southern slopes of the Pegu Yomah above Rangoon ; Tenasserim ; South Andamans.—Fl. Decb. ♀ Fr. Febr.

4. *J. ATTENUATUM*, Wall. Cat. 2864 ; DC. Prod. VIII. 309.

HAB. Not unfrequent in the damp hill-forests of Martaban, especially the Nattoung mountains, at 5000 to 7200 ft. elevation.—Fl. Fr. March.

5. *J. LAURIFOLIUM*, Roxb. Fl. Ind. I. 91 ; DC. Prod. VIII. 303.

Var. *a. GENULNUM*, calyx-lobes up to 4 lin. long, much longer than the calyx-tube.♂

Var. *β. BRACHYLOBUM*, calyx-lobes as long or a little longer than the calyx-tube, more or less recurved.

HAB. Var. *β.* frequent in the tropical forests of Martaban and Tenasserim ; Ava, Khakyen hills (J. Anderson).—Fl. Febr.—April ; Fr. April, May.

6. *J. SAMBAC*, Ait. Hort. Kew. ed. 1. I. 8; Wight Icon. t. 704; DC. Prod. VIII. 301; Bot. Reg. t. 1 and t. 497.—(*J. quinqueflorum*, Heyne ap. DC. Prod. VIII. 302.)

HAB. Frequently cultivated all over Burma and often met with in neglected lands, poonzohs and rubbishy places near villages, but apparently not really wild. Said to be wild in Prome district.—Fl. March, April.

7. *J. ANASTOMOSANS*, Wall. Cat. 2863; DC. Prod. VIII. 305.

HAB. Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and in those from Martaban down to Tenasserim.—Fl. March, April.

8. *J. ROTTLEBIANUM*, Wall. Cat. 2865; DC. Prod. VIII. 305; Wight Icon. t. 1249.

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, especially along the Choungmeniah choung (Khaboung). Fl. April.

9. *J. COARCTATUM*, Roxb. Fl. Ind. I. 91; DC. Prod. VIII. 308. (*J. reticulatum*, Wall. Cat. 2869; DC. Prod. VIII. 303).

HAB. Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and in those of Martaban east of Tounghoo; also hills of Chittagong.—Fl. April, May.

Roxburgh's plant has the calyx 5-lobed while Wallich's has it usually 8-lobed.

10. *J. HIRSUTUM*, Willd. sp. pl. I. 36; Smith Exot. Bot. II. 117. t. 118; Wight Icon. t. 702; Bot. Mag. t. 1931; Bot. Reg. t. 15. (*Nyctanthes hirsuta*, L. sp. pl. 8; *J. multiflorum*, Andr. Bot. Repos. t. 496, non Roth; *J. pubescens*, Willd. sp. pl. I. 37; Roxb. Fl. Ind. I. 91; DC. Prod. VIII. 302).

HAB. Ava, Bhamo (J. Anderson); Pegu (Dr. Brandis).—Fl. Jan.

11. *J. SCANDENS*, Vhl. Symb. III. 2; DC. Prod. VIII. 306; Roxb. Fl. Ind. I. 89. (*J. syringæfolium*, Wall. Cat. 2861; DC. Prod. VIII. 306.)

Var. *α*. *GENUINUM*, all parts more glabrous, the branchlets and leaves especially so.

Var. *β*. *LÆTUM*, (*J. lætum*, Wall. Cat. 2859; DC. Prod. VIII. 306), the branchlets, nerves of the leaves, and sometimes also the under-surface of the leaves themselves puberulous.

HAB. Frequent in all leaf-shedding forests, especially the tropical and open ones, all over Burmah, from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. Dec.—Febr.; Fr. April, May.

12. *J. GRANDIFLORUM*, L. sp. pl. 9; DC. Prod. VIII. 313; Bot. Reg. t. 91; Roxb. Fl. Ind. I. 100.

HAB. Burmah (accord. Rev. F. Mason.)

**Schrebera, Roxb.**

1. SCH. SWIETENIOIDES, Roxb. Corom. Pl. II. 1. t. 101 and Fl. Ind. I. 109; DC. Prod. VIII. 675; Bedd. Sylv. Madr. t. 248.

Var.  $\alpha$ . GENUINUM, all parts glabrous, also the inflorescences, calyxes and corollas; capsules 2 in. long.

Var.  $\beta$ . PUBESCENS, (*Sch. pubescens*, Kurz in Flora 1872. 399), all younger parts and inflorescence softly pubescent; calyx densely and minutely tomentose; corolla sparingly puberulous outside; capsules much smaller.

HAB. Var.  $\alpha$ . not unfrequent in the mixed forests all over Pegu and Martaban, entering also the savannahs.—Fl. April; Fr. Jan.

**Chionanthus, L.**

(*Linociera*, Swartz).

**Conspectus of Species.**

\* *Petals or corolla-lobes very narrow, involute.*

Glabrous; nerves prominent beneath; petals  $\frac{3}{4}$  lin. long, ..... *Ch. minutiflorus*.

\* \* *Petals or corolla-lobes broader, flat or concave, but not involute.*

× Veins visible between the strong lateral nerves. (Leaves 3—6 in. long).

Panicle ample, leafy-bracted; nerves impressed on the upper side of the leaves; drupes 1—1½ in. long, ..... *Ch. Palembangicus*.

Panicles rather small, with minute bracts; nerves prominent on both sides; drupes  $\frac{1}{2}$  in. long, ..... *Ch. macrophyllus*.

× × No visible veins between the nerves. (Leaves 6—10 in. long.)

Panicle minutely puberulous; petals linear; drupes about an in. long, .. *Ch. montanus*.

1. CH. MINUTIFLORUS, Kurz in For. Fl. Burm. II. 159.

HAB. Martaban hills east of Tounghoo (Dr. Brandis).

2. CH. PALEMBANGICUS, Miq. Suppl. Fl. Sumatr. 558; Kurz in Journ. As. Soc. Beng. 1876. 139.

HAB. Not unfrequent in the coast-forests of the Andamans.—Fl. May, June.

3. CH. MACROPHYLLUS, (*Linociera macrophylla*, Wall. Cat. 2826. A.; DC. Prod. VIII. 297; *Linociera attenuata*, Wall. Cat. 2839; *Linociera picrophloja*, F. Muell. Fragm. III. 139. t. 24?).

HAB. Ava (J. Anderson); Pegu (Brandis); tropical forests of Upper Tenasserim (Wall.).—Fr. Jan.

4. CH. MONTANUS, Bl. Bydr. 681; Miq. Fl. Ind. Bat. II. 552. (*Ch. insignis*, Miq. Suppl. Fl. Sumatr. 559).

HAB. Rather rare in the hill-eng-forests of Martaban east of Tounghoo, at 1500 to 2000 ft. elevation; Upper Tenasserim (Falconer; Helf. 3688).

*Doubtful Species.*

1. *Linociera* ? *oblonga*, Wall. Cat. 2844 ; DC. Prod. IV. 298.

HAB. Ava, Taong-dong.

2. *L.* ? *loranthifolia*, Wall. Cat. 2842 ; DC. Prod. VIII. 298.

HAB. Upper Tenasserim, Amherst.

The fragments seen by me look Olacinaceous.

*Olea*, Tournef.

*Conspectus of Species.*

- \* Corolla almost rotate, the limb spreading. Inflorescence axillary, or at the same time terminal. (*Olea*, *L.*)

× Petals only a line long or thereabouts.

Leaves rigidly coriaceous, the nerves prominent ; panicle glabrous, ..... *O. dentata*.

Leaves thin-coriaceous, the nerves prominent ; panicles glabrous, ..... *O. dioica*.

× × Petals about 3 lin. long.

Leaves veinless between the nerves ; drupes nearly  $\frac{1}{2}$  in. long, ..... *O. terniflora*.

- \* \* Corolla funnel-shaped, with a longer or shorter tube. Panicles all terminal.

(*Ligustrum*, Tournef.)

Panicles glabrous or pubescent ; drupe 3—4 lin. long, ..... *O. robusta*.

1. *O. DENTATA*, Wall. Cat. 2840 ; DC. Prod. VIII. 286.—(*O.* ? *salicifolia*, Wall. Cat. 2821 ; DC. l. c.).

HAB. Frequent in the drier hill-forests and the hill-eng-forests of Martaban and Upper Tenasserim, at 2000 to 3000 ft. elevation ; also in the tropical forests above Rangoon.—Fl. June—Jan. ; Fr. April, May.

2. *O. DIOICA*, Roxb. Fl. Ind. I. 106 ; DC. Prod. VIII. 286.

HAB. Hills of Chittagong.—Fl. March, Apr. ; Fr. July.

3. *O. TERNIFLORA*, (*Linociera* ? *terniflora*, Wall. Cat. 2845 ; DC. Prod. VIII. 297 ; *Linociera* ? *acuminata*, Wall. Cat. 2844 ; DC. l. c. 298 ; *O. linoceroides*, Wight Icon. t. 1241 ?)

HAB. Frequent in the tropical and moister upper mixed forests of the Pegu Yomah and from Martaban down to Tenasserim ; also Chittagong.—Fl. Dec., Jan. ; Fr. Jan.

4. *O. ROBUSTA* (*Phillyrea robusta*, Roxb. Fl. Ind. I. 101 ; *Visiania robusta*, DC. Prod. VIII. 289 ; *Ligustrum robustum*, Kurz Pegu Rep. App. A. 88.)

Var. *a.* *GENUINA*, panicle puberulous and more or less glabrescent ; leaves glabrous.

Var. *β.* *PUBESCENS* (*Ligustrum pubescens*, Wall. Pl. As. rar. III. 44 in adnot. ; DC. Prod. VIII. 294 ; *Visiania Sumatrana*, Miq. Fl. Ind. Bat. II. 549 ; *Ligustrum punctatum*, Griff. Not. Dicot. 741).

HAB. Hills of Pegu (Brandis) ; Chittagong ; Var. *β.* Ava, Taong-dong (Wall.) and in forests around Moulmein, Upper Tenasserim (Griff.). Fl. July, Aug. ; Fr. Nov., Decb.

**Myxopyrum, Bl.**

1. *M. SMILACIFOLIUM*, Bl. Mus. Lugd. Bat. I. 320.—(*Chondrospermum smilacifolium*, Wall. Cat. 2837 ; DC. Prod. VIII. 301 ; *Ohionanthus ? smilacifolius*, Wall. in Roxb. Fl. Ind. I. 108).

Var. *α*. *GENUINUM*, leaves more or less entire or remotely and minutely spinescent-toothed ; panicle ample, slender, as long as or longer than the leaves.

? Var. *β*. *ILICIFOLIUM*, leaves somewhat narrower and stronger nerved and veined, strongly and crowdedly spinose-serrate ; panicles rather contracted, not above 2 in. long, axillary and leaf-opposed, rarely terminal, the peduncle and branchings strong and 4-cornered.

HAB. Var. *α*. in the forests of Chittagong ; var. *β*. rather frequent in the tropical forests of Martaban and in those of the Andaman and Cocos islands.—Fl. April, May.

*Chondrospermum ? coriaceum*, Wall. Cat. 2838 ; DC. Prod. VIII. 301. (nomen nudum), from Ava, Taong-dong, is unknown to me.

**Azima, Lamk.**

1. *A. TETRACANTHA*, Lamk. Encycl. Bot. I. (1783) 343 ; Poir. in Lamk. Ill. Gen. III. (1823) 401 t. 807.—(*Monetia barlerioides*. L'Her. Stirp. Nov. I. (1784) I. t. 1 ; Tulasn. in Ann. d. sc. nat. 4 ser. VIII. 113 ; Miq. Fl. Ind. Bat. I/2 596 ; *Eugonia montana*, Miq. Fl. Ind. Bat. I/2. 496, teste Hf.).

HAB. Frequent in the dry forests and shrubberies of Ava and Prome, occasionally entering the savannahs.—Fr. March.

**APOCYNACEÆ.***Conspectus of Species.*

*Ser. I. GYMNOSPERMÆ.* Seeds naked, *i. e.*, without a deciduous tuft of hairs at their extremities, sometimes persistently hairy-fringed all round, more so at the extremities. Anthers free.

\* *Corolla valvate in bud.*

*Trib. 1. STRYCHINEÆ.* Ovary entire, 2-celled, with axile placentas.

STRYCHNOS. Corolla-throat naked or bearded. Berry corticate or sappy, the seeds imbedded in pulp. Albumen horny. Trees or scandent shrubs.

\* \* *Corolla twisted-imbricate in bud.*

*Trib. 2. CARISSEÆ.* Ovary entire, 2—1-celled, with axile or parietal placentas.

\* *Ovary 1-celled, with 2 parietal placentas.*

× Fruit an indehiscent drupe or berry.

CHILOCARPUS. \* Corolla-throat naked. Seeds in pulp. Albumen horny. Scandent shrubs.

WALLUGHBEIA. \* As preceding, but seeds without albumen. Scandent shrubs.

× × Fruit a dehiscent capsule.

ALLAMANDA. Corolla-throat with scales, the anthers included in the tube; albumen scanty. Erect shrubs, with showy 5-merous flowers.

\* \* Ovary 2-celled, with axile placentas.

× Corolla-throat furnished with 5 or 10 scales or appendages. Disk none.

THEVETIA. Calyx many-glanded inside. Drupe unequally 2-celled, not pulpy. Trees or shrubs, with large flowers.

MELODINUS. Calyx glandless inside. Drupe incompletely 2-celled, the seeds in pulp. Albumen fleshy. Scandent shrubs.

× × Corolla-throat naked.

CARISSA. Corolla salver-shaped, hairy within. Style short or filiform. Ovary-cells 1—4, rarely many-ovuled, the ovules in 2 rows. Berry 3—1-celled, sappy. Albumen fleshy. Shrubs or trees, usually spiny-armed.

WINCHIA. Apparently like preceding, but the style deeply 2-cleft and the ovules in numerous rows. Unarmed, with ternary leaves.

Trib. 3. PLUMERIEÆ. Ovary consisting of 2 more or less distinct carpels, each with a single placenta.

\* Fruit-carpels indehiscent, not follicular.

× Calyx gamosepalous.

RAUWOLFIA. Calyx toothed. Corolla elongate-funnel-shaped. Disk cupular or annular. Drupes sappy, usually connate at the base or up to the middle. Albumen fleshy. Herbs, under-shrubs, or shrubs.

OCEIROSLA. Calyx toothed or lobed. Disk none or obsolete. Drupes usually paired, fleshy-fibrous. Trees or shrubs.

× × Sepals free, reflexed.

CERNERA. Calyx glandless inside. Disk none. Drupes usually single by abortion, fibrose-woody. Trees.

\* \* Fruit-carpels follicular, dehiscing along the ventral suture; rarely indehiscent. Corolla-throat naked.

× Seeds in no way winged nor hairy-fringed.

† Seeds not imbedded in pulp.

‡ Albumen none.

KOPSIA. Follicle elliptical to oblong, indehiscent, 1-seeded. Trees.

CALPICARPUM. Follicle broad, obliquely truncate, slowly dehiscing, 1-seeded. Shrubs.

‡ ‡ Albumen present.

VINCA. Follicle elongate-linear, continuous, many-seeded. Albumen fleshy. Erect shrubs or under-shrubs.

GYNOROGON. Follicle elongate, moniliform-contracted between the seeds. Albumen horny, homogeneous. Shrubs, more or less twining.

HUNTERIA. As preceding, but albumen ruminato.

† † Seeds imbedded in pulp.

TABERNÆMONTANA. Follicles continuous, several-seeded. Albumen none. Disk none. Erect shrubs.

× × Seeds winged or hairy-fringed.

PLUMIERIA. Disk none or fleshy and adnate to the calyx. Follicles elongate, many-seeded. Seeds winged. Albumen none. Fleshy trees.

ALSTONIA. Corolla salver-shaped. Anthers included. Seeds fringed all along the borders, more so at both extremities. Albumen scanty. Trees or shrubs.

*Ser. II. COMESPERMÆ.* Seeds furnished at one or both ends with a deciduous tuft or crown of long silky hairs; anthers usually cohering in a cone.

*Trib. 4. ECHITIDÆ.* Characters as above.

\* *Corolla-throat naked, without scales. Seeds comose at the apex only or rarely fringed all round.*

× Disk annular, cupular, or consisting of 5 free or connate scales. Scandent shrubs.

+ Ovary entire, 2-celled.

† Anthers included.

BEAUMONTIA. Calyx-segments leafy. Disk-glands 5, free or connate. Albumen fleshy. Flowers large and showy.

† † Anthers more or less exserted.

VALLARIS. Calyx small. Corolla almost rotate-bell-shaped. Disk 5-lobed. Albumen scanty. Flowers rather showy.

PARSONNIA. Calyx small. Disk-scales 5, free or connate. Filaments often spirally twisted. Flowers small.

+ + Ovary-carpels 2, distinct.

† Anthers exserted, cohering in a cone round the stigma.

POTTIA. Disk 5-lobed. Flowers small, panicked.

† † Anthers included in the corolla-tube. Disk cupular or 5-cleft.

○ Corolla induplicate-valvate.

URCEOLA. Corolla urceolate or globose. Calyx glandless inside. Disk entire or 5-lobed. Flowers small.

○ ○ Corolla twisted-imbricate.

‡ Seeds narrowed at apex into a long slender neck.

§ Follicle moniliform.

PARAMERIA. Corolla salver- or almost bell-shaped. Calyx many-glanded inside. Flowers small.

§ § Follicle continuous, not moniliform.

ECDYSANThERA. Corolla almost urceolate, the lobes sinistrorsely twisted. Disk entire or 5-lobed. Flowers small.

ANDRON. Corolla salver-shaped, the lobes narrow. Disk truncate or 5-lobed. Follicle woody-coriaceous. Seeds albuminous. Flowers small.

CEROCOMA. Corolla salver-shaped, the lobes broad. Disk 5-cleft. Follicle coriaceous. Albumen none. Flowers rather showy.

‡ ‡ Seeds not contracted into a long neck.

§ Ovary-carpels more or less immersed in the fleshy disk.

AGANOSMA. • Calyx large and leafy, divided almost to the base. Disk-lobes short. Anthers appendaged. Flowers large and showy.

ICHTOCARPUS. Corolla salver-shaped. Disk-lobes on the top of the ovary, distinct. Flowers small. Calyx gamosopalous, 5-toothed.

• EPIGYNUM. Corolla salver-shaped. Disk-lobes epigynous round the ovary and almost connate.

§ § Ovary entirely superior.

CHONEMORPHA. Corolla very large, salver- or funnel-shaped, the lobes twisted. Follicle woody. Albumen scanty.

× × Disk none, or rudimentary. Trees.

HOLARRHENA. Corolla salver-shaped. Stamens included. Seeds comose at the apex only. Albumen none.

\* \* Corolla-throat with a corona of scales or fringes. Disk none.

× Anthers included in the corolla-tube. Seeds comose at the apex.

NERIUM. Corolla-tube with 5 lacinate-toothed scales. Seed albuminous. Erect trees or shrubs.

× × Anthers exerted, united or cohering in a cone round the stigma.

Seeds comose at the hilum.

STROPHANTHUS. Corolla-lobes elongate or caudate, bordered by membranous lobes or scales, each produced into 2 longer or shorter segments. Shrubs, usually scandent.

WRIGHTIA. Corona of corolla consisting of 5 or 10 erect scales either distinct or united, or rarely the throat naked. Trees or erect shrubs.

### **Strychnos, L.**

#### *Conspectus of Species.*

\* Erect trees, without tendrils.

× Corolla glabrous at the throat, the tube long.

Corymbs peduncled, terminal or terminating axillary shoots; berries the size of an orange or smaller, many-seeded, the pericarp thick and corky, .... *St. nux-vomica*.

× × Corolla villous at the throat.

Panicle very short, axillary; corolla-tube about 2 lin. long; berries 1-seeded, the pericarp coriaceous, ..... *St. potatorum*.

Panicle brachiate, large, terminal; corolla-tube 4—5 lin. long, ..... *St. Wallichiana*.

\* \* Scandent shrubs with woody, 2-cleft hook-tendrils.

Corolla-tube  $1\frac{1}{2}$  lin. long, bearded at the throat; berry oblong, 1-seeded, the pericarp membranous, ..... *St. laurina*.

Corolla consisting of 5 free glabrous petals; berry globular, 1- (or 2 ?) seeded, the pericarp coriaceous, ..... *St. acuminata*.

1. *ST. NUX-VOMICA*, L. sp. pl. 271; Roxb. Corom. Pl. I. 8. t. 4 and Fl. Ind. I. 575; DC. Prod. IX. 15 (excl. syn. *S. colubrina*, Wight Icon. t. 434); Bth. in Linn. Proc. I. 103 (excl. syn. *S. ligustrina*, Bl.); Griff. Not. Dicot. 82. t. 411. f. 1; Bedd. Fl. Sylv. Madr. t. 243.

HAB. Common in the leaf-shedding forests, especially the upper mixed and low ones, all over Burma, from Ava and Martaban down to Tenasserim, up to 2000 ft. elevation.—Fl. April, May; Fr. CS.

2. *ST. POTATORUM*, L. f. Suppl. 148; Wight Illustr. II. t. 156; DC. Prod. IX. 15; Roxb. Corom. Pl. I. 9. t. 5 and Fl. Ind. I. 576.

HAB. Not unfrequent in the open and dry forests of the Prome District; also Ava.—Fr. Sept.—March.

3. *ST. WALLICHIANA*, Steud. Nomencl.; DC. Prod. IX. 13; Bth. in Linn. Proc. I. 103.

HAB. Rare in the tropical forests of the eastern slopes of the Pegu Yomah, as along the northern Choungmenah (Khaboung-choung).—Fl. April.

4. *ST. LAURINA*, Wall. Cat. 1591; DC. Prod. IX. 13; Bth. in Linn. Proc. I. 102; Griff. Not. Dicot. 83.

HAB. Tenasserim, from Moulmein down to Mergui.—Fl. Aug.

Of *St. ovalifolia*, Wall. (Bth. l. c. 103) I have seen only Penang specimens with young inflorescences which may belong to the above. The panicles, however, are long-peduncled and axillary, and the tube seems very long and not bearded at the throat.

5. *ST. ACUMINATA*, Wall. Cat. 1593; DC. Prod. IX. 14.

HAB. Not unfrequent along the rocky sea-coasts of the Andamans; Tenasserim (Wall.).—Fl. Fr. April, May.

### **Willughbeia, Roxb.**

#### *Conspectus of Genera.*

Inflorescence shortly peduncled; berry ovate, smooth, ..... *W. edulis*.  
Flower-clusters sessile or nearly so; berry globular, wrinkled, ..... *W. Martabanica*.

1. *W. EDULIS*, Roxb. Corom. Pl. III. t. 280 and Fl. Ind. II. 57; DC. Prod. VIII. 321.

HAB. Chittagong.—Fl. Fr. nearly  $\infty$ .

2. *W. MARTABANICA*, Wall. Pl. As. Rar. III. 45. t. 272; DC. Prod. VIII. 321.

HAB. Martaban, Thoungyeen (Dr. Brandis); Upper Tenasserim, Moulmein (Wallich.).—Fr. April.

### **Allamanda, L.**

\*1. *A. CATHARTICA*, L. Mant. 214; DC. Prod. VIII. 318.

HAB. Much cultivated in villages all over Burma, and in the Moulmein District apparently half-wild (Falconer).

### **Thevetia, L.**

\*1. *TH. NERIIFOLIA*, Juss. in Steud. Nomencl. cit.; DC. Prod. VIII. 343. (*Cerbera Thevetia*, L. sp. pl. 304; Bot. Mag. t. 2309).

HAB. Much cultivated in Burmese villages, especially in Prome.—Fl. March.

### **Carissa, L.**

#### *Conspectus of Species.*

\* \* *All parts glabrous.*

Ovary-cells 4-ovuled; berries the size of a plum; leaves usually blunt or retuse,

.. *C. carandas*.

Ovary-cells 2-ovuled; berries the size of a pea or somewhat larger; leaves usually acute,..... *C. diffusa*.

\* \* *All parts, especially while young, shortly and softly puberulous.*

Ovary-cells 2-ovuled; berries the size of a pea,..... *C. hirsuta*.

1. *C. CARANDAS*, L. Mant. 52; Roxb. Corom. Pl. I. 55. t. 77 and Fl. Ind. ed. Wall. II. 523; DC. Prod. VIII, 332; WA. in Comp. Bot. Mag. I. 276. t. 12; Wight Icon. t. 426; Bedd. Fl. Sylv. Madr. 156. t. 19. f. 6.

Var.  $\beta$ . *CONGESTA*, Bedd. Man. For. Fl. Madr. I. 157 (*C. congesta*, Wight Icon. t. 1289), leaves almost orbicular; cymes short.

Var.  $\gamma$ . *PAUCINERVIA*, Bedd. l. c. (*C. paucinervia*, Wight Icon. t. 1290), leaves linear-lanceolate.

HAB. Var.  $\alpha$ . Very frequent in the dry forests of the Prome District. Fl. March.

2. *C. DIFFUSA*, Roxb. Fl. Ind. ed. Wall. II. 524; DC. Prod. VIII. 332; Wight Icon. t. 427.

HAB. Andamans, Termoklee island, along the rocky coast.—Fl. Fr. May.

3. *C. HIRSUTA*, Roth Nov. pl. sp. 128; DC. Prod. VIII. 333. (*C. villosa*, Roxb. Fl. Ind. ed. Wall. II. 525; Wight Icon. t. 437).

HAB. Ava, apparently frequent in the Irrawaddi valley.—Fr. Jan.

### **Winchia, A. DC.**

#### *Conspectus of Species.*

Panicle glabrous, ..... *W. calophylla*  
Panicle minutely puberulous, ..... *W. atroviridis*.

1. *W. CALOPHYLLA*, DC. Prod. VIII. 326.; Deless. Icon. sel. V. t. 46.

HAB. Upper Tenasserim, Moulmein (Wall.).—Fl. March.

2. *W. ATROVIRIDIS*, Kurz For. Fl. Burm. II. 170. (*Chilocarpus ? atroviridis*, Bl. Mus. Lugd. Bat. 153; *Hunteria ? atroviridis*, Wall. Cat. 1614; DC. Prod. VIII. 351).

HAB. Tenasserim, Tavoy (Gomez).

Probably not sufficiently distinct from the preceding species. *Hunteria cuspidata*, Wall. Cat. 1609 (DC. Prod. VIII. 351) without indication of locality seems to be a Malayan plant and is probably the same as *Melodinus orientalis*, Bl.

### **Rauwolfia, L.**

1. *R. SERPENTINA*, Bth. and Hf. Gen. pl. II. 697. (*Ophioxylon serpentinum*, Willd. sp. pl. IV. 979; Roxb. Fl. Ind. ed. Wall. II. 530; DC. Prod. VIII. 342; Wight Icon. t. 849).

HAB. Very frequent in the mixed and open, especially in the savannah forests, all over Burma from Chittagong and Ava down to Tenasserim. Fl. April, May.

**Ochrosia, Juss.**

1. *O. SALUBRIS*, Bl. Mus. Lugd. Bat. I. 158.—(*Cerbera oppositifolia*, Lamk. Enc. Bot. I. 62; DC. Prod. VIII. 354).

HAB. Rare in the tidal and beach-forests of the Andamans.—Fl. Fr. Febr., March.

**Cerbera, L.**

1. *C. ODALLAM*, Gaertn. Fruct. II. 193. t. 124; Roxb. Fl. Ind. ed. Wall. I. 692; DC. Prod. VIII. 313; Bot. Mag. t. 1845; Wight Icon. t. 441.

HAB. Not unfrequent in the littoral, chiefly the tidal, forests, from Chittagong down to Tenasserim and the Andamans.—Fl. March—May.

**Calpicarpum, G. Don.**

1. *C. ROXBURGHII*, G. Don. Gen. Syst. Diehl. IV. 100; Wight Icon. t. 431. (*Kopsia vincaeflora*, Bl. Bydr. 1030; DC. Prod. VIII. 352; *Kopsia fruticosa*, DC. Prod. I. c.; Bot. Mag. t. 4220; *Cerbera fruticosa*, Roxb. Fl. Ind. ed. Wall. I. 690).

HAB. Martaban, tropical forests, as in Yoonzelcen (Brandis); Tenasserim, Tavoy (Wall.); Rangoon (Cleghorn); generally planted in all Burmese villages.—Fl. Aug.—Decb.

**Vinca, L.**

\*1. *V. ROSEA*, L. sp. pl. 305; Roxb. Fl. Ind. II. 1.; Bot. Mag. t. 248; DC. Prod. VIII. 382. (*V. Guillemi Waldemarii*, Klotzsch Bot. Ergebn. Prinz Waldemer. t. 70).

HAB. A South-American plant much cultivated in villages all over the country, and sometimes domesticated in rubbishy places.—Fl. Jan.—May.

**Gynopogon, Forst. (1786).**

(*Alyxia*, Banks.)

**Conspectus of Species.**

Corolla-tube nearly  $\frac{1}{2}$  in. long, ..... *G. stellatum*.  
Corolla-tube only about 2 lin. long, ..... *G. breviflorum*.

1. *G. STELLATUM*, Lab. Sert. Austr. Caled. 30. t. 34.—(*Alyxia stellata*, Roem. and Schult. Syst. Veg. IV. 439; DC. Prod. VIII. 346; Miq. Fl. Ind. Bat. II. 407; Roxb. Fl. Ind. ed. Wall. II. 639; *Alyxia odorata*, Wall. Cat. 1606; DC. Prod. VIII. 347).

HAB. Along the rocky sea-coasts of Tenasserim and the Andamans.—Fl. April, May.

2. *G. BREVIFLORUM*, Kurz in For. Fl. Burm. 177.

HAB. In the tropical forests of Martaban, Yoonzeleen (Brandis); Upper Tenasserim, Taoo table-land, at about 2000 ft. elevation (Brandis).

**Hunteria**, Roxb.

1. *H. LANCEOLATA*, Wall. Cat. 1611; DC. Prod. VIII. 350. (*Gynopogon lanceolatum*, Kurz in For. Fl. Burm. II. 177.)

HAB. Tenasserim Tavoy (Wall.).

Unknown to me. Can it be the same as my *Gynopogon breviflorum*?

**Tabernæmontana**, Plum.

*Conspectus of Species.*

\* *Bractlets persistent, longer than the pedicels.*

Corolla-tube longer than the tube; calyx-lobes 2—3 lin. long, linear-lanceolate,

... *T. recurva*.

Corolla-lobes half as long as the tube, ..... *T. calycina*.

\* \* *Bracts and bractlets very deciduous and small, or persistent and minute.*

× Calyx-lobes acute or acuminate. Follicles tapering at the base but not stalked, without an appendage (usually cylindrical, with 6 longitudinal lines often raised.)

+ Cymes branched from the base and the branchings usually recurved or horizontal.

O Flowers large, showy, the corolla-lobes as long as the tube.

Corolla about an in. across, the lobes as long as the tube; all parts glabrous,

... *T. divaricata*.

O O Flowers small, the corolla-lobes only  $\frac{1}{2}$ — $\frac{1}{3}$  the length of the tube.

Glabrous; calyx-lobes acute; corolla-tube hardly  $\frac{1}{2}$  in. long, ..... *T. ophiorrhizoides*.

Glabrous, very like the preceding; calyx-lobes rather acute; corolla-tube nearly an inch long; follicles long-beaked, ..... *T. rostrata*.

+ + Cymes brachiate, longer or shorter peduncled, more or less erect.

O Calyx-lobes broad, leafy, 3—4 lin. long.

Glabrous; corolla-lobes nearly as long as the tube, ..... *T. alternifolia*.

O O Calyx-lobes narrow, small.

Glabrous, the cymes short-peduncled; calyx-lobes subulate-acuminate; corolla-tube slender,  $\frac{3}{4}$  in. long, the lobes half as long or shorter; anthers inserted below the middle of the corolla-tube, ..... *T. membræifolia*.

Glabrous, leaves exactly as in preceding; cymes long-peduncled; calyx-lobes said to be ovate, rather blunt, ..... *T. graciliflora*.

Glabrous; peduncle 3 times as long as the 4—5 lin. long petioles; calyx-lobes ovate, acute, ..... *T. microcarpa*.

× × Calyx-lobes rounded. Follicle long-stalked, with a coriaceous acuminate dorsal appendage.

Glabrous; cymes small, longer or shorter peduncled, ..... *T. subcapitata*.

1. *T. RECURVA*, Roxb. Hort. Bengh. 20 and Fl. Ind. II. 26; Wight Icon. t. 476; DC. Prod. VIII. 371.—(*T. gratissimu*, Ldl. Bot. Reg. t. 1084).

HAB. Frequent in the tropical forests of the southern spurs of the Pegu Yomah above Rangoon; also in Upper Tenasserim and Chittagong, apparently always in the neighbourhood of tidal streams.—Fl. May, June.

2. *T. CALYCINA*, Wall. Bot. Reg. in adn. ad t. 1273 and Cat. 1577 ; DC. Prod. VIII. 372.

HAB. Tenasserim, Tavoy (Wall.).

Not seen by me, and probably same as preceding.

3. *T. DIVARICATA*, Bl. Bydr. 1027, non Don. (*Nerium divaricatum*, L. sp. pl. 306 ; *T. coronaria*, R. Br. Hort. Kew. II. 72 ; DC. Prod. VIII. 373 ; Roxb. Fl. Ind. II. 23 ; Wight Icon. t. 477).

HAB. Generally planted in villages all over Burma and the adjacent islands.—Fl. Oct.—Dec.

4. *T. OPHIOMRHIZOIDES*, Kurz in Journ. As. Soc. Beng. 1873. 89.

HAB. Frequent in the hill-forests of Martaban, at 3000 to 5000 ft. elevation.—Fl. April.

5. *T. ROSTRATA*, Wall. in Bot. Reg. adnot. ad. t. 1273 and Cat. 1578 ; DC. Prod. VIII. 371.

HAB. Ava, Irrawaddi valley, at Segain (Wall.).—Fl. Fr. Nov.

I have seen only fruiting specimens, which in foliage quite agree with the preceding species (which is a bill-species).

6. *T. ALTERNIFOLIA*, L. sp. pl. 308 ; Roxb. Fl. Ind. II. 24. (*T. crispa*, Roxb. Hort. Beng. 20 and Fl. Ind. II. 24 ; Wight Icon. t. 470 ; DC. Prod. VIII. 371).

HAB. Frequent in the beach-forests, and along the coasts generally, of the Andamans.—Fl. Febr.—May ; Fr. March, April.

7. *T. MEMBRANIFOLIA*, Kurz in Journ. As. Soc. Beng. 1873. 90.

HAB. In the tropical forests of Toukyeghat, east of Tounghoo.—Fl. April, May.

I fear referable to the following species, of which I have now seen only a very imperfect specimen. The leaves are the same in both.

8. *T. GRACILIFLORA*, Wall. in Bot. Reg. adnot. ad. t. 1273 and Cat. 1576 ; DC. Prod. VIII. 372.

HAB. Tenasserim, Amherst (Wall.).

9. *T. MICROCARPA*, Wall. in Bot. Reg. adnot. ad. t. 1273 and Cat. 1581. ; DC. Prod. VIII. 372.

HAB. Ava, Taong-dong (Wall.).

Unknown to me.

10. *T. SUBCAPITATA*, Wall. Cat. 1579 ; DC. Prod. VIII. 373.

HAB. Pegu (more probably Martaban) (Dr. Brandis) ; Tenasserim, Tavoy (Wall.).—Fl. Dec.

#### Plumieria, Tournef.

\*1. *P. ACUTIFOLIA*, Poir. Suppl. II. 667 ; DC. Prod. VIII. 392. —(*P. acuminata*, Ait. Hort. Kew ed. alt. I. 70 ; Roxb. Fl. Ind. II. 20 ; Bot. Mag. t. 3952 ; Wight Icon. t. 471).

HAB. Very frequently planted in Burmese villages.—Fl. March, April.

**Alstonia, R. Br.**

*Conspectus of Species.*

Inflorescence densely pubescent, ..... *A. scholaris*.  
Peduncles glabrous, the calyx and pedicels minutely puberulous, ..... *A. spectabilis*.

1. *A. SCHOLARIS*, R. Br. in Mem. Wern. Soc. I. 76; DC. Prod. VIII. 409; Wight Icon. t. 422 (mala); Bedd. Sylv. Madr. t. 242.

HAB. Not unfrequent in the leaf-shedding, especially the open and dry, forests, from Prome and Martaban down to Tenasserim; also Chittagong.—Fl. Oct.—Sept.

2. *A. SPECTABILIS*, R. Br. in Mem. Wern. Soc. I. 76; DC. Prod. VIII. 409.

HAB. Coast-forests of the Andamans.

Hardly specifically different from the preceding species.

**Beaumontia, Wall.**

1. *B. GRANDIFLORA*, Wall. Tent. Fl. Napal. 15. t. 7; Bot. Reg. t. 911; Bot. Mag. t. 3213; DC. Prod. VIII. 403.—(*Echites grandiflora*, Roxb. Fl. Ind. II. 14, non Roth).

HAB. Chittagong hills.—Fl. DS.

**Vallaris, Burm.**

1. *V. HEYNEI*, Spreng. Syst. veg. I. 635; Dalz. and Gibson Bomb. For. 144 (*V. dichotoma*, Wall. Cat. 1621; Wight Icon. t. 438; DC. Prod. VIII. 400; *Echites dichotoma*, Roxb. Fl. Ind. II. 19; *Peltandra solanacea*, Roth. nov. sp. 132).

Var.  $\alpha$ . *GLABRA*, all parts glabrous.

Var.  $\beta$ . *PUBESCENS*, all the softer parts puberulous, the leaves (adult) minutely rough-puberulous beneath.

HAB. Frequent in the dry, especially the mixed dry, forests of the Prome District.—Fl. Fr. March.

*Doubtful Species.*

1. *V. ? anceps*, Wall. Cat. 1622; DC. Prod. VIII. 400 (nomen nudum).

HAB. Tenasserim, Tavoy (Wall.).

I have only seen leaves, which seem hardly referable to *Apocynaceæ*.

**Parsonsia, R. Br.**

1. *P. SPIRALIS*, R. Br. in Wall. Cat. 1631; DC. Prod. VIII. 402. (*Heligme Javanica*, Bl. Bydr. 1043; DC. Prod. VIII. 425; *P. oblonga*,

Wall. Cat. 1632 ; DC. Prod. VIII. 402 ; *Heligme Rheedii*, Wight Icon. t. 1303 ? ; *Spirostemon spiralis*, Griff. Not. Dicot. 80. t ? 411 f. 1 )

HAB. Pegu, above Rangoon ; Upper Tenasserim, Moulmein (Wall.), —Fl. April.

#### **Pottsia**, Hook. and Arn.

1. *P. CANTONIENSIS*, Hook. and Arn. Bot. Voy. Beech. 198. t. 43 ; Miq. Fl. Ind. Bat. II. 450 (*Euthodon paniculatus*, Griff. Not. Dicot. 48. t. 458. f. 2.)

HAB. Tenasserim, Mergui (Griff.).

#### **Urceola**, Roxb.

1. *U. LUCIDA*, Bth. and Hf. Gen. pl. II. 716 (*Chavannesia lucida*, DC. Prod. VIII. 444 ; *Chavannesia esculenta*, DC. Prod. l. c. ; *Urceola esculenta*, Bth. in Kurz For. Fl. Burm. II. 184).

HAB. Common all over Pegu (*teste* G. W. Strettell) ; Tenasserim (Wall.).

#### **Parameria**, Bth.

1. *P. GLANDULIFERA*, Bth. and Hf. Gen. Pl. II. 715. (*Ecdysanthera glandulifera*, DC. Prod. VIII. 443 ; Wight Icon. t. 1307 ; *E. Griffithii* Wight in text pedicellis et calyce pubescente ; Miq. Fl. Ind. Bat. II. 452 ; *Ecdysanthera barbata*, Miq. Fl. Ind. Bat. II. 451).

HAB. Not unfrequent along the borders of the tidal forests of the coast of the Andamans ; also Tenasserim.—Fr. March, April.

#### **Ecdysanthera**, Hook. and Arn.

1. *E. BRACHIATA*, DC. Prod. VIII. 443.

HAB. Ava ; Khakyen hills (J. Anderson).—Fl. RS.

#### **Anodendron**, A. DC.

1. *A. PANICULATUM*, A. DC. Prod. VIII. 442. (*Echites paniculata*, Roxb. Fl. Ind. II. 17 ; Wight Icon. t. 396).

HAB. Not unfrequent in the tropical forests of the Pegu Yomah, Martaban, and Tenasserim, especially along chougus.—Fl. Jan., Febr. ; Fr. the following year.

#### **Cercocoma**, Miq. non Don.

(*Rhynchodia*, Bth.).

1. *C. WALLICHII*, Miq. Fl. Ind. Bat. II. 445. (*Echites rhyncosperma*, Wall. Pl. As. rar. I. 43. t. 49 ; *Rhyncosperma Wallichii*, DC. Prod. VIII. 431).

HAB. Not unfrequent in the tropical forests of Martaban down to Tenasserim, rare along the eastern slopes of the Pegu Yomah; also Ava (Mrs. Burney).—Fl. April.

***Ichnocarpus*, R. Br.**

1. *I. FRUTESCENS*, R. Br. Hort. Kew. ed. 2. 69; DC. Prod. VIII. 435; Wight Icon. t. 430. (*Echites frutescens*, Roxb. Fl. Ind. II. 12).

Var. *α*. *GENUINA*, leaves and follicles glabrous.

Var. *β*. *PUBESCENS*, leaves beneath (while young on both sides) and the young follicles appressed rusty-pubescent.

HAB. Frequent in the leaf-shedding, especially the mixed and savannah-, forests all over Burma; var. *β*. chiefly in the dry forests of Ava and Prome.—Fl. CS.; Fr. HS.

***Aganosma*, G. Don.**

*Conspectus of Species.*

Calyx-lobes nearly an inch long, tawny-velvety; nerves of leaves impressed,

.. *A. calycina*.

Calyx-lobes only 2—3 lin. long, glabrous; nerves of leaves prominent beneath and uniting towards the margin, ..... *A. marginata*.

1. *A. CALYCINA*, DC. Prod. VIII. 432. (*A. Wallichii*, Don Gen. Syst. IV. 77.)

HAB. Tenasserim, Tavoy (Gomez).—Fl. Sept.

2. *A. MARGINATA*, G. Don. Gen. Syst. IV. 77; DC. Prod. VIII. 433; Wight Icon. t. 425. (*Echites marginata*, Roxb. Fl. Ind. II. 15; *A. macrocarpa*, DC. Prod. VIII. 434).

HAB. Frequent in the open and lower mixed forests from Ava and Martaban down to Tenasserim; also Chittagong.—Fl. March, April; Fr. the next year.

***Epigynum*, Wight.**

1. *E. GRIFFITHIANUM*, Wight Icon. t. 1308; Walp. Ann III. 42.

HAB. Tenasserim, Mergui (Griff.).

***Holarrhena*, R. Br.**

1. *H. ANTIDYSENTERICA*, Wall. Cat. 1672; DC. Prod. VIII. 413; Brand. For. Fl. 326. t. 40.—(*Chonemorpha antidysenterica*, G. Don Gen. Syst. Gard. IV. 79; Wight Icon. t. 439).

Var. *α*. *GENUINA*, all parts (also the inflorescence) glabrous.

Var. *β*. *CODAGA* (*H. Codaga*, G. Don Gen. Syst. Gard. IV. 78; DC. Prod. VIII. 414; Wight Icon. t. 1297; *H. pubescens*, Wall. Cat. 1673; DC. Prod. VIII. 413), all parts (also the inflorescence) shortly velvety pubescent.

HAB. Not unfrequent in the dry and open forests, all over Burma, from Chittagong and Ava down to Tenasserim; var. *β*. chiefly in the drier upper mixed forests.—Fl. March, April; Fr. CS.

**Chonemorpha**, G. Don.*(Epichysianthus*, Voigt.)

1. CH. MÆROPHYLLA, G. Don Gen. Syst. IV. 76; DC. Prod. VIII. 430; Wight Icon. t. 432.—(*Echites macrophylla*, Roxb. Fl. Ind. II. 13; *Ch. mollis*, Miq. Fl. Ind. Bat. II. 444).

HAB. Frequent in the tropical forests of the Andamans, especially along choungs.—Fl. May.

**Nerium**, L.

1. N. OBORUM, Sol. Hort. Kew. ed. 1. I. 297; Roxb. Fl. Ind. II. 2; Bot. Mag. t. 2032; DC. Prod. VIII. 420.

HAB. Often cultivated in villages, especially around monasteries, all over Burma.

**Strophanthus**, DC.*Conspectus of Species.*

\* *Corolla-lobes acute or acuminate, but not produced into long tails.*

Floral bracts ovate, acute, stiff, only  $1\frac{1}{2}$  lin. long, ..... *St. brevicaudatus*.

\* \* *Corolla-lobes produced into tails 2 or more inches long.*

• × Floral bracts and the calyx-lobes stiff, linear-subulate.

Corolla (without the tails) about an inch long, ..... *St. Griffithii*.

Corolla (without the tails) about  $\frac{1}{2}$  in. long, ..... *St. longicaudatus*.

× × Floral bracts and the calyx-lobes flaccid, reflexed, linear.

Corolla about  $\frac{3}{4}$  in. long; bristles twice as long as the anthers, ..... *S. caudatus*.

1. ST. BREVICAUDATUS, Wight Icon. t. 1302.

HAB. Doubtful, probably Mergui, Tenasserim (Griff.).

N. B. The Griffithian specimens of this species in H. BC. are from Malacca.

2. ST. GRIFFITHII, Wight Icon. t. 1300; Miq. Fl. Ind. Bat. II. 412. •—(*St. pentaphyllus*, Griff. Not. Dicot. 78; *St. Horsfieldianus*, Miq. Fl. Ind. Bat. II. 442).

HAB. Upper Tenasserim, Moulmein (Falconer).

3. ST. LONGICAUDATUS, Wight Icon. t. 1299; Miq. in Fl. Ind. Bat. II. 442.

HAB. South Tenasserim.

4. ST. CAUDATUS, (*Echites caudata*, Burm. Fl. Ind. 68, t. 26; *St. dichotomus*, DC. in Bull. Soc. Philom. III. 123 and Prod. VIII. 407; *Nerium caudatum*, Roxb. Fl. Ind. II. 9).

HAB. Tenasserim, from Moulmein down to Tavoy (Rev. Parish, Falconer).—Fl. Jan.

**Wrightia, R. Br.**

*Conspectus of Species.*

\* *Throat of corolla furnished with scales or fringes.*

× Corolla-throat fringed with a ring of branched long filiform scales.

All parts glabrous; corolla white, the lobes linear-oblong..... *W. tinctoria*.

× × Scales of corolla-throat thick and fleshy, entire or lobed.

All parts especially the leaves, shortly and densely pubescent; corolla-lobes broad, the scales of the throat cuneate, 2—3-lobulate,..... *W. mollissima*.

All parts glabrous; corolla red, the lobes broad, the scales large, rounded, obsolete crenate,..... *W. coccinea*.

\* \* *Corolla-throat quite naked.*

Glabrous, the leaves small and narrow; pedicels filiform; corolla small, white,

... *W. religiosa*.

1. *W. TINCTORIA*, R. Br. in Mem. Wern. Soc. I. 73; Wight Icon. t. 411; Bot. Reg. t. 933; DC. Prod. VIII. 406; Bedd. Sylv. Madr. t. 241 (*Nerium tinctorium*, Roxb. Fl. Ind. II. 4).

HAB. Burmah (according to Rev. F. Mason), probably Ava?

2. *W. MOLLISSIMA*, Wall. Cat. 1627 and Pl. As. rar. II. t. 116; DC. Prod. VIII. 405. (*W. Wallichii*, DC. Prod. VIII. 405; Dalz. and Gibs. Bomb. Fl. 145?).

HAB. Common in the lower and upper mixed forests, from Chittagong and Ava down to Tenasserim, up to 2000 ft. elevation.—Fl. April, May; Fr. CS.

3. *W. COCCINEA*, Sims. Bot. Mag. t. 2696; Bot. Cab. t. 894; Wight Icon. t. 112; DC. Prod. VIII. 407. (*Nerium coccineum*, Roxb. Fl. Ind. II. 2).

HAB. Chittagong hills.

4. *W. RELIGIOSA*, Bth. Gen. pl. II. 713. (*Echites religiosa*, Teysm. and Binn. in Nat. Tydseh. Ned. Ind. XXV. 48).

HAB. Tenasserim and the adjoining Siamese provinces.—Fl. Fr. HS.



# JOURNAL

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### Part II.—PHYSICAL SCIENCE.

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No. IV.—1877.

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XIV.—*Note on two Species of Asiatic Bears, the “Mamh” of Balúchistán and Ursus pruinus, Blyth, of Tibet, and on an apparently undescribed Fox from Balúchistán.*—By W. T. BLANFORD, F. R. S., &c.

(Received and Read Novr. 7th, 1877.)

For some years past I have endeavoured to obtain a specimen of the small bear, which is known to inhabit Baluchistan and the hilly regions of Western Sind. This bear is well known to residents in Sind by its Baluch name of “Mamh” or “Mum,” and individual animals have on rare occasions been found straying on to the alluvial flats of the Indus valley. I first heard of a dark-coloured bear in Western Balúchistán, when I accompanied Major St. John on the Perso-Baluch boundary Survey in the year 1872, but neither at that time, nor in the course of several months spent in Sind in 1875-76-77, could I procure a skin for examination. I have seen fresh tracks of the animal in the Khirthar range in Western Sind, and not only I myself, but several friends have endeavoured to obtain a specimen. Not long since a discussion took place in the columns of the ‘Pioneer’ newspaper as to this animal, and it was suggested that it might be a baboon, and hinted that it must be a myth. The latter hypothesis appeared supported by the extraordinary tales told of the animal by the inhabitants of the country, such as their belief that, except in the presence of man, it always walks on its hind legs, and a still more remarkable tale, that all “Mamhs” are females, that each seizes a man and forces him to cohabit with her, after laming him to prevent his escaping, the young be-

ing, of course, "Mamhs" like the mother. Probably the folk lore of Baluchistan would furnish many other wonderful stories of the animal, if enquiry were made.

Quite recently my friend Major Mockler, the Political Agent at Gwádar on the Makrán coast, who has very kindly been trying, for some time past, to procure this and other animals for me, obtained a skin from a Baluch chief, Mir Wajedád of Túmp, about 70 miles north of Gwádar. This skin, which I received a few days since, had unfortunately remained for two months at Gwádar during Major Mockler's absence and without his knowing of its arrival, and much of the hair has consequently come off, but still there is abundance left to shew the characters of the fur. The skull is wanting, but the feet have been partly preserved.

From the circumstance that I was assured by all my native informants both in Sind and Baluchistan that the "Mamh" was a black bear, I was rather inclined to anticipate that it might prove to be the common Indian sloth bear *Ursus (Melursus) labiatus*. We have no precise information as to the bears of Afghanistan, but *Ursus isabellinus* of the Western Himalayas and *U. syriacus* which inhabits Persia are both pale coloured animals, and although the Indian bear is not, so far as I am aware, known to occur within the Indus valley, or the desert tracts which bound that valley to the eastward, (it is mentioned by Stoliczka as a very rare straggler into the easternmost part of Cutch,) still it might of course be found in the Balúchistán hills. A single glance at the skin sent by Major Mockler is however sufficient to shew that it belongs to a very different animal from the sloth bear of India. The latter has long coarse black hair and very long claws; in the Balúchistán skin the hair is brown, rather short, and moderately fine, and the claws are unusually small.

It is impossible to identify the Sind and Balúchistán animal with the black *Ursus torquatus* (commonly but most improperly known as *U. tibetanus*) and the only remaining bears of western and central Asia are *U. arctos*, *U. syriacus* and *U. isabellinus*. It is still a moot point amongst naturalists how far these forms are distinguishable, but they all agree in being large bears, considerably exceeding *U. labiatus* in dimensions, whilst the skin from Balúchistán entirely bears out the statement made by various observers, and confirmed by all the information which I have been able to procure in Sind, that the "Mamh" is an exceptionally small form of the genus. Even if the present specimen be immature, the texture of the fur appears harsher, and the hairs shorter than in *U. arctos* and its allies, whilst the colour distinguishes the species from *U. torquatus*. There can I think be but little doubt that the present animal is unnamed; it may be an exceptionally small race of *U. arctos*, but even in this case the difference is so great as to entitle the Balúchistán animal to a distinctive

name. I propose therefore to call it, from the ancient name of the country it inhabits.

URSUS GEDROSIANUS, sp. nov.

Syn. *U. sp.* (?? *Melursus labiatus*) Zoology of Persia, p. 47.

*Ursus minor, brunneus, torque pectorali albido, pilis breviusculis indutus, unguitibus brevibus. Longitudo tota vix quinque pedes: unguitibus singularibus in pede antico sesqui-pollicaribus.*

The colouration is nearly uniform, being a dark rufous brown, much the same as the ordinary tint of European individuals of *U. arctos*. The shoulders and the outside of the limbs appear to be darker than the back, the belly paler. On the breast there is a narrow white semicircular collar, the ends of which are not prolonged upwards in front of the shoulders as in *U. isabellinus*; the muzzle is whitish and the extremity of the chin white. The ears are not preserved. The claws are dark coloured, (several have been lost,) the inner claw on the fore foot measures 1.6 inches in a straight line from base to tip, the second claw on the hind foot 1.25 in the same manner. The sole of the hind foot, somewhat dried and contracted of course, measures 7 inches, and the whole skin, which has been dressed, but apparently not stretched, is about  $4\frac{1}{2}$  feet long from nose to rump.

The fur, though not very coarse, is harsh and stiff, the hair is about  $2\frac{1}{2}$  inches long on the shoulders, but not more than  $1\frac{1}{2}$  elsewhere. The hairs are rather thin, probably from the animal having been killed in the hot season. Major Mockler writes to me that he is endeavouring to procure a better specimen and a skull, and I hope that it will be possible before long to give a more complete description of this bear and its affinities.

Concerning the range of *U. Gedrosianus*, it appears to be found throughout the hills of Balúchistán to the foot of the Persian highlands. When travelling through western Balúchistán in 1872, Major St. John learned that the pale coloured Syrian bear replaces the dark Balúchistán animal near Bam in Narnashir. To the west, as already noticed, the 'Mamh' is found in all the higher hills of western Sind, from the neighbourhood of the sea to the Bolán pass, and it probably occurs throughout Kelát. To the northward we know very little about bears; none are mentioned by Hutton in his 'Rough notes on the Zoology of Candahar,' J. A. S. B. XIV, p. 340, &c., and we have no precise information as to the kind which inhabits Afghanistan, except that Burnes (Cabool, p. 163), says it is of a reddish brown colour, which renders it possible that the species may be identical with that found in Balúchistán.

Before describing a fox, of which two specimens were sent by Major Mockler with the skin just described, it may be as well to give a descrip-

tion of another imperfectly known species of bear, for the skin of which I am indebted to Mr. L. Mandelli. The skin was brought to Mr. Mandelli at Darjiling by a man who said that he had purchased it at Lhasa, and that the animal inhabited the plains in the neighbourhood of that city. I could find no description of this animal until Dr. Anderson called my attention to a notice by Mr. Blyth in the Society's Journal for 1853, Vol. XXII, p. 589, of an imperfect skin, supposed to be that of a variety of the Himalayan black bear (*Ursus torquatus* v. *tibetanus*) for which the name *pruinus* was suggested, should the species prove distinct. Whilst I doubt whether a name thus bestowed has any claim to recognition, I shall retain the term proposed in the present case, as it appears unobjectionable. The specimen was briefly noticed in Blyth's Catalogue of the Mammalia in the Museum of the Asiatic Society, and in Jerdon's 'Mammals', as the 'Blue Bear' of Tibet, a name under which the original specimen was sent by Dr. Campbell. The skin now received is perfect and in fair condition, but the greater part of the skull is wanting, only the jaws having been retained with the skin, and even of these the hinder teeth are defective. The animal was probably of considerable size, judging by the teeth, which are much larger than any in the skulls of *U. isabellinus* in the Museum, except in one case, of which more presently. It is manifest that the animal is distinguished by the characters of the fur, claws and dentition, from *U. torquatus*, and that it is in all probability closely allied to *U. isabellinus*, and consequently to the European bear, *U. arctos*.

#### URSUS PRUINOSUS.

Blyth, J. A. S. B., 1853, XXII, p. 589.

'Blue Bear' of Tibet; Blyth, Cat. Mam. Mus. As. Soc., p. 76.—Jerdon, Mammals of India, p. 71.

*Ursus major, affinis U. isabellino, supra fusco-fulvus, pilis dorsalibus longiusculis, confertis, submollibus, nigris, fulvo-terminatis, capite hirsutis, artubus nigris, unguibus pallidis fortibus.*

The general colouration above is tawny brown, palest on the head and shoulders, darker on the back, where the hairs are black with tawny tips, and black on the limbs. The head is tawny, much of the same colour as *Ursus isabellinus*, a little darker and browner under the eyes and on the forehead: the ears have tufts of long hair mixed tawny and black. Behind the head the neck is rather darker, but on the upper part of the breast there is a broad pale tawny crescentic band, with the upper terminations prolonged upwards, in front of the shoulder, almost to the back, precisely as in *U. isabellinus*. In *U. labiatus* and *U. torquatus* the band is confined to the breast, and the same appears to be the case in *U. Gedrosianus*. The upper and hinder parts of the shoulders in *U. pruinus* are covered with tawny

hairs about  $3\frac{1}{2}$  to 4 inches long, whilst the interscapular region, like the rest of the back, is clothed with black hairs, fulvous at the tips. The hair is moderately fine and about 3 inches long on the back. Apparently the animal when killed was about to lose its long winter coat, for the hair is much felted and matted together in places, and a short fine tawny hair is seen to be growing beneath. The hoary appearance given to the fur by the fulvous tips is extremely characteristic, but it may very possibly be less conspicuous at some seasons.

The claws are pale in colour, strong, and moderately curved, the first (and largest) claw on the fore foot measuring 2.2 inches in a straight line from insertion to tip, and 2.75 round the curve; the corresponding measurements of the first hind claw are 1.3 and 1.4 inches.

The animal is evidently old, several of the premolars have been lost, and the alveoli obliterated; the molars are much worn. As already mentioned the size of the teeth and especially of the molars is unusually large; the canines appear very little larger than in *U. labiatus*. The posterior molar in the upper jaw is wanting on one side and imperfect on the other, it must be nearly  $1\frac{1}{2}$  inches long and its anterior portion is 0.88 broad, the antepenultimate (1st true molar) measures 0.9 inch in length by 0.72, the tooth anterior to this or hindmost premolar is 0.62 long. The three together when perfect must have measured nearly 3 inches in length. The 1st lower true molar measures 1.02 long by 0.53 broad, the second 1.05 by 0.63, the 3rd and hindmost 0.83 by 0.62.

It has already been mentioned that there is in the Society's old collection, now in the Indian Museum, a very large bear's skull attributed to *Ursus isabellinus*. The skull, No. 224, (t. of Blyth's Catalogue is called "Enormous skull from Kashmir purchased 1858." I was, I believe, with Mr. Blyth when he purchased this skull in the Calcutta Bazaar, at the shop of a dealer in all kinds of similar articles, where heads of various animals from very different parts of India were mixed together. Thus I remember myself purchasing on the same occasion an *Oris Hodysoni* skull and a fine frontlet of *Cervus Duvaucelli*; one of course from Tibet originally, the other from the plains of India. I should consequently attach no importance whatever to the supposed locality.

Now the teeth of this large bear's skull resemble those in the jaws of Mr. Mandelli's specimen of *Ursus pruinus* so closely, that it is by no means improbable that both may have belonged to the same species. The former is larger than any other skull of *Ursus isabellinus* in the Museum and the molar teeth are unusually large, though still inferior in size to those of *U. pruinus*. The following are a few dimensions:

Length from anterior edge of *foramen magnum* to end of premax-

illaries, ..... 12.5

|                                                          |     |
|----------------------------------------------------------|-----|
| Breadth across hinder portion of zygomatic arches, ..... | 8·8 |
| Breadth of frontal bones between orbits, .....           | 3·3 |
| Breadth of palate between posterior molars, .....        | 1·9 |
| Length of 3 posterior molars in upper jaw, .....         | 2·7 |
| Length of lower jaw from angle to symphysis, .....       | 9·8 |

The bears of India and the neighbouring regions, so far as known, now consist of the following species :

*Ursus Malayanus*. Malay Peninsula and Burma to Arakan.

*U. torquatus*. Forest region of the Himalayas, and, it is said, the hills South of Assam.

*U. pruinus*. Plains of Eastern Tibet.

*U. isabellinus*. Western Himalayas, chiefly above the forests, unknown in Tibet, and even in the Upper Indus Valley, Ladakh, &c.

*U. (Melursus) labiatus*. Plains and hills of Peninsular India and Ceylon, extending, it is said, into the hills South of Assam.

*U. Gedrosianus*. Hills of Western Sind.

Of the above *U. pruinus* is the only species not found within Indian limits. The discovery that *Ursus pruinus* is widely different from *U. torquatus* removes the last excuse for applying to the latter animal a name derived from a country in which no such species exists. The range of *Ursus torquatus* has now been fairly ascertained to be Cis-Himalayan in Southern Asia, although some naturalists refer bears from Japan and Eastern Siberia to the same species, and as the use of the specific name *Tibetanus* involves a serious error, some other term should be substituted.

Fortunately in this instance there is no need to suggest a new name, for Wagner,\* in 1841, proposed to call this bear *U. torquatus* on the ground that the animal not being known in Tibet, the original name given by Cuvier was inappropriate. Wagner's name was adopted by Schinz†, and subsequently by Dr. J. E. Gray‡, who however appears to quote Schinz as its author. Mr. Blyth, in the 'Catalogue of the Mammalia in the Museum Asiatic Society,' p 77, referred *U. torquatus*, Schinz, to *U. labiatus*, but this is evidently a mistake, as can be seen from Schinz's description and from the facts mentioned above. It is probable that Mr. Blyth, who worked under the disadvantage of having a very imperfect scientific library at command, took the reference from some other authority.

No one can be more averse than I am in general to changing specific names, but I think, following the British Association rule, that a name

\* Schreber, Säugethiere, Supplement band, II, p. 144.

† Syn. Mam., I, p. 302.

‡ P. Z. S., 1864, p. 688; Cat. Carn. Pach. Edent. Mam., Brit. Mus., 1869, p. 225.

should be altered when it involves serious error, that the change is justified in the present instance.

With the skin of *Ursus Gedrosianus*, Major Mockler sent to me two well-preserved skins and a perfect skeleton of a singularly small and very grey fox, with the following note: 'I send two skins and a skeleton of the 'Pol' which seems to be a very diminutive fox. They were shot by one of my 'sepoys in the hills about 15 miles from Gwádar; he sat up at night for 'them over water, and threw about some dates and fish as bait.'

The 'Pol' appears to me to be the same as the small Bushire fox, which, in the Zoology of Persia,\* I referred, with doubt, after examining a young living specimen at the Zoological Gardens in London, to *Canis famelicus*,† Rüpp. That the present animal must however be distinct from that described by Rüppell is, I think, shewn by the dimensions: in *Canis famelicus* the length of the head is 5 inches 6 lines, (French measure = 5.85 English,) and the whole length from nose to end of tail 2 ft. 10 in. (about 3 feet English,) of which the tail is 1 ft. 2 in. (1 ft. 3 in. English). Now in the little Baluchistan fox, the skull is only about 3½ inches long and the whole length of the skeleton 2 ft. 7 in. of which about 1 ft. 1 in. belong to the tail. It is not clear whether Rüppell in measuring the tail included the hair at the end, if he did, that would account for 2 or 3 inches of the length and the present animal would have a proportionally longer tail, but in any case, allowing for the probability that the measurements given in Rüppell's work are from a stuffed specimen, the difference in the size of the head is quite inconsistent with the identification of the Baluchistan animal with *Canis famelicus*. The colour moreover in the former is much greyer, and the chestnut dorsal stripe of *C. famelicus* wanting or very faintly represented. I propose to name the Baluchistan fox from its grey colour.

VULPES CANUS, sp. nov.

'*Tulpes famelicus* ? Rüpp.' Eastern Persia, II, p. 41.

*V parvus*, *V. famelico affinis sed minor, magis griseus, atque fuscá dorsali castaneá fere vel omnino carens, capite nuclá tergoque anteriore interdum rufescentibus, dorso nigro-lavato, pilorum apicibus albis, abdomine albedo, auriculis extus isabellino-griseis, caudá pilis longis albidis supra posticeque nigro terminatis, indutá. Long. tota, pilis ad extremitatem caudæ inclusis, circa 33, caudæ 15, cranii 3.6, pol. angl.*

The general colour is grey, blackish on the back and the upper por-

Eastern Persia, Vol. II, p. 41.

† Rüppell, Atlas, p. 15, Taf. 5.

tion and end of the tail, the lower parts from the breast including the under surface of the tail white, the muzzle in front of the eyes dusky brown, sides of the head pale rufous, forehead more rufous, the hairs being brown at the base with scattered white tips, which are also found on the dusky muzzle.

The ears are grey outside with a slight rufescent tinge, white inside. In one specimen the ears are more dusky than in the other, which is shewn by the teeth of the skull to have been an aged animal. The hair of the body is soft and long, the longest hairs on the middle of the back being about 2 inches in length, with much fine under fur of a grey colour, dark ashy in one specimen, pale ashy in the other, the longer hairs on the back are black near the ends, the tips of many being white. On the anterior portion of the back in one specimen, the hairs are rufous between the grey base and the blackish tip, and the rufous colour extends along the back of the neck. This imperfectly marked rufous colour doubtless represents the chestnut stripe in *V. fanelicus*. The gape and chin are dusky, the breast ashy grey, the abdomen white. The fore legs are pale rufescent in the older specimen, dusky grey in the younger, the hind legs rufous brown outside in the one animal, dusky black in the other, the tail is very bushy, the hairs grey or white with long black ends above and at the tip, so that the tail appears blackish except below, where it is white or nearly white. The skins are too much stretched for their measurement to be of any use, except in the case of the tail, which measures 15 to 16 inches; of this the hairs at the end are about 2½ in. The measurements above given are founded on the skeleton.

The skull, which, as already mentioned, is that of an aged animal, is very small and almost destitute of crests. The hinder portion of the brain pan is much rounded and the small occipital crest very low on the back of the head, being in fact about equally distant from the *foramen magnum* and the top of the skull. The following are measurements of this skull:

|                                                                                 | inches | metre |
|---------------------------------------------------------------------------------|--------|-------|
| Length from occipital crest to anterior termination of premaxillæ, .....        | 3.65   | ·092  |
| „ from anterior margin of <i>foramen magnum</i> to do., .....                   | 3.35   | ·084  |
| „ of suture between nasal bones, .....                                          | 1.12   | ·028  |
| Breadth of nasal portion of skull at posterior termination of premaxillæ, ..... | 0.57   | ·014  |
| „ of frontal region behind postorbital processes, .....                         | 0.73   | ·018  |
| „ of brain case where widest across parietal region, .....                      | 1.4    | ·025  |
| „ of skull across zygomatic arches, .....                                       | 2.02   | ·0505 |

|                                                                                                                                                                                       |      |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|
| Length of bony palate from anterior termination of premaxillæ to opening of posterior nares, (measured to end of small posterior projecting process in the middle of the palate,) ... | 1·85 | ·047  |
| Breadth of bony palate between penultimate molars (1st true molars,) .....                                                                                                            | 0·47 | ·012  |
| Length of last upper premolar, .....                                                                                                                                                  | 0·38 | ·0095 |
| „ of 1st molar, .....                                                                                                                                                                 | 0·26 | ·0065 |
| Breadth of do., .....                                                                                                                                                                 | 0·37 | ·009  |

Of the limb bones the humerus is 3·1 inches long, the radius 3, the femur 3·13; and the tibia 3·58.

*P. S.*—Since the preceding description of *Ursus Gedrosianus* was in type, Dr. Duke has written to the ‘Pioneer’ to say that he has received two imperfect skins of a ‘Mamh’ obtained near Quetta, and that they are black. It remains to be seen whether the black and brown bears of Baluchistan are varieties or distinct. The former is more probable.

XV.—*On an apparently new hare, and some other mammalia from Gilgit.*

—By W. T. BLANFORD, F. R. S.

(Received and Read Novr. 7th, 1877.)

A small collection of mammals made in the course of last year by Captain Biddulph in the extreme north-western part of Kashmir was left by him in the Indian Museum, with a request that I would examine the specimens. The skins comprise a fox, an otter, a hare, a *Lagomys*, and a mouse.

The fox appears to me to be probably a form of *Vulpes montanus* in summer dress. A similar specimen was obtained by Captain Biddulph in Káshghar and made over by him to Dr. Stoliczka. The fur is very short; there being, in fact, scarcely anything but the underfur left, and even that is thin. Under these conditions the colour differs widely from that of *V. montanus* in its winter garb, and most skins are taken when the fur is in fine condition. The specimen is from Hanza (probably a place of that name N. N. E. of Gilgit), and was obtained at an elevation of 8000 feet. Another precisely similar, except that the ears were less black, was also procured.

In the skin before me, the face is rufous, deepest in front of the eyes, the ears sooty black outside, the middle of the back ferruginous with a brown tinge from the under fur, a very distinct rufous cross band on the shoulders, so as to form a marked cross on the back, and the sides of the body very pale. Lower parts dirty white. Tail not full, very woolly, (as is the fur generally,) slightly rufous above, elsewhere dirty white mixed with

black hairs, the tail-tip white. Legs rufous externally with dark hairs intermixed.

The otter-skin unfortunately wants the skull, and it is impossible to determine it accurately. It has evidently belonged to a large form, approaching *Lutra vulgaris* in size, but it is much paler in colour. The upper parts are somewhat light brown, the under fur being very pale whitish brown at the base, then rich wood-brown, rather rufous, with numerous longer hairs mixed, which have whitish tips, giving a pale speckled appearance to the fur. On the lower parts the under fur is white at the base, then light brown, with long white hairs intermixed, so that the general colour is slightly sullied white. The whiskers are white. Sides of the head below the ears and eyes, chin, and throat rather whiter than the breast and abdomen.

This animal may belong to the Central and Northern Asiatic species, referred by various naturalists to *L. vulgaris*. The exact locality is not given, but the specimen was doubtless obtained on the upper Indus or one of its tributaries.

Of the mouse only a dried skin is preserved. The locality is marked 'Hanza 8000 feet,' and is probably the place already mentioned. I am unable to identify this skin with any known species: it closely resembles *Mus Bactrianus*, but appears distinguished by having the upper surface of the tail very much darker than the lower and by longer feet. The colour above is brown, below whitish, the tail dark brown above, pale isabelline below, feet whitish. The skin measures from nose to rump 2·6, tail very little above 2, tarsus without claws 0·75. I do not like to propose a new name on the amount of evidence before me. *M. Bactrianus* is said by Jerdon to have been sent from Kashmir, the only localities given by Blyth however are in the Panjab. I have since obtained this mouse from various parts of Sind, from Ajmere, where it has been found by Major St. John, and throughout many parts of Baluchistan and Southern Persia. It is possible that the Hanza mouse may be merely a variety.

The hare I am unable to identify with any known species and I therefore propose to name it from its discoverer.

#### LEPUS BIDDULPHI, sp. nov.

*L. minor*, ad *L. Tibetanum*, *L. Pamirensemque proxime accedens, supra pallide rufescens, pilorum apicibus nigris intermixtis, infra albus, caudâ superne nigra, uropygio cum dorso concolore, auribus mediocribus, apicibus ad marginem nigris, collo pectoreque pallide rufescentibus; vellere molli, longiusculo, ad basin cinereo. Long. corii desiccati a rostro ad basin caudæ 19, caudæ cum pilis 4·5, tarsi 5, auris extus 4·25 poll. Angl.*

*Hab. in Yassin (Gilgit) provincid ad Kashmir pertinente, ultra flumen Indum jacente.*

The general colour above is rather pale rufous, with a dusky wash caused by the tips of the longer hairs being black. There does not appear, in the only skin I have examined, to be the grey rump of *L. Pamirensis* and several other Central Asiatic species. The forehead and central portion of the muzzle is pale rufescent grey, the hairs rufous ashy at the base, then brown, and isabelline at the tips. The sides of the head are paler, but a few black tips are found on the hairs of the cheeks. There is a pale ill-defined band on each side of the muzzle, including the eye. Whiskers black at the base, white towards the end; some wholly white. Anterior portion of the ears outside nearly the same colour as the forehead, hair soft, not so dense and harsh as in *L. Pamirensis*, posterior portion of outer surface pale rufous, extreme tip of ear black outside, the black running about a third of the way down the posterior edge. Neck all round and breast pale rufous, hairs ashy at the base and pale tipped, except on the nape. Fur of body soft, on the hinder part of the back the hair is about  $1\frac{1}{2}$  inches long, and consists of coarser piles mixed with fine woolly under fur. Throughout the dorsal portion the hair is ashy at the base, then isabelline, followed by a brown ring, the end being pale rufous, except in the longest hairs, which are tipped black. Tail sooty black above. Limbs externally pale rufous. Underparts white.

The skull of *Lepus Biddulphi* differs from that of *L. Tibetanus* in the following characters. The parietals are broader and flatter, the width of the frontals greater and they are somewhat more convex just behind the post-orbital processes. The nasals are truncated behind, the angle formed by the junction of the posterior and exterior margins being a right angle as in *L. Stoliczkanus* and *L. Yarkandensis*, differing in this respect from *L. Tibetanus*, *L. Pamirensis*, and *L. hypsibius*. The hinder extremities of the premaxillæ are parallel with the hinder margin of the nasals, the jugal is narrower vertically. The muzzle is less high and the whole skull flatter. The palatal opening is smaller and differently formed behind. The opening of the posterior nares is narrower. The lower jaw is much less high.

The nearest approach to the skull of *L. Biddulphi*, amongst the species of which specimens are available for comparison, is made by the hare which inhabits the Karakash valley between Ladak and Yarkand. This species much resembles *L. pallipes* of Hodgson from the portion of Tibet north of Nepal and Sikkim. In the skull of the Karakash hare, however, the nasals extend backwards to some distance beyond the terminations of the premaxillæ, the zygomatic arch is broader and more convex beneath, the postorbital processes are differently shaped and the whole skull larger.

The skull, extracted from the skin, is imperfect behind, and the length cannot be measured. It was probably under  $3\frac{1}{2}$  inches. The following are some of the dimensions :

|                                                                                | In.  | Met. |
|--------------------------------------------------------------------------------|------|------|
| Length of suture between nasal bones,.....                                     | 1·23 | ·031 |
| Greatest breadth across hinder portion of zygomatic arches, .....              | 1·6  | ·04  |
| Breadth of brain case behind glenoid fossa, ...                                | 1·17 | ·029 |
| Breadth of frontal region where narrowest behind post-orbital processes, ..... | 0·57 | ·014 |
| Breadth of nasals where widest near posterior termination,.....                | 0·62 | ·016 |
| „ „ at anterior end, .....                                                     | 0·51 | ·013 |
| Length of bony palate behind anterior palatal orifices, ..                     | 0·25 | ·006 |
| Width of do. between anterior molars,.....                                     | 0·45 | ·011 |
| Length of row upper molars, .....                                              | 0·61 | ·015 |
| „ of lower jaw from angle to symphysis,...                                     | 2·25 | ·057 |
| Height do. to condyle, .....                                                   | 1·32 | ·033 |

The *Lagomys* I find somewhat difficult to determine. Captain Bidulpha has collected two specimens, one from the Gilgit district, obtained at an elevation of 10,000 feet, the other from the Kishengunga valley, at 7500 ft. On the whole these specimens appear to me to agree best with *L. auritus*, the species inhabiting the Indus valley in Ladak at moderate elevations, but the ears, so far as can be judged, are much smaller, scarcely exceeding in size those of *L. Roylei*. The dimensions however appear larger than those of *L. Roylei*, and the fur is much longer and softer. The colouration of the upper parts is greyish brown, the face being rufous to a variable extent, and there being in both skins a marked rufous patch below the ears, (the glandular patch noticed in skins of some species of *Lagomys* by Dr. Günther; Ann. Mag. Nat. Hist. Sept. 1875, Ser. 4, Vol. XVI, p. 230,) though this is evidently a variable character, for whilst in one skin, and this has the forehead less rufous than the other, the patch below the ear is ferruginous, and the breast, shoulders and flanks rufous, in the other skin the tinge is much fainter and is confined to the sides of the neck. The lower parts are white, faintly tinged with rufous in one specimen, the blackish basal portion of the hair shewing conspicuously.

The skull is very near that of both *L. auritus* and *L. Roylei*; from that of the former it only differs in having the nasals a little broader behind, and the orbits a trifle smaller, and from that of the latter by

similar small differences. Neither the external characters nor the skull agree with *L. rufescens*.

The following is a summarized list of the species above discussed:

1. *Vulpes montanus*.
2. *Lutra*, either *L. vulgaris*, var. or an allied species.
3. *Mus*, probably new, allied to *M. Bactrianus*.
4. *Lepus Biddulphi*, sp. nov.
5. *Lagomys auritus*? var.

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XVI.—*On a supposed new Sheep from the Central Hills of Kelat.*—By  
A. O. HUME.

(Received 30th October; Read 7th November, 1877.)

(With plate IV.)

I received last year from Major Sandeman, C. S. I., Political Superintendent of Kelat, the head and horns of a sheep which he supposed to be the same as the orial (*Ovis cycloceros*) and which had been obtained in the Hills above the Bolan pass.

Directly I saw these horns I was struck with their greater length and slenderness, and their peculiar twist, and after comparing them with two specimens of *O. Vignei*, and numerous specimens of *O. cycloceros*, and the description of *O. Gmelini*, the head appears to me to belong to a hitherto undescribed species.

In all these three species, as far as I can make out, each horn lies in one plane, whereas in the present species the horn twists out, in a capital S. fashion. There is in fact much the same difference between the horns of the present species and of *O. cycloceros*, that there is between those of *O. Kareleni*, and *O. Hodgsoni*.

It seems to me not impossible that this species may be one at any rate of the wild stocks from which the domesticated breed originated.

I propose to name this sheep

OVIS BLANFORDI.

after my friend Mr. W. T. Blanford, our well known Zoologist and Geologist.

The following are the dimensions of the skull and horns with corresponding dimensions of those of a specimen of *O. cycloceros*, of apparently the same age, viz., about 8 years. In the case of each measurement, the dimension first given is that of *O. Blanfordi*.

|                                                                                                            |        |       |
|------------------------------------------------------------------------------------------------------------|--------|-------|
| Length from the occipital crest to the end of the premaxillaries, .....                                    | 10·25, | 10·85 |
| „ from the anterior border of the foramen magnum,...                                                       | 9·85,  | 8·55  |
| „ of the bony palate from the opening of the posterior nares to the extremity of the premaxillaries, ..... | 4·7,   | 4·5   |
| „ of the upper molar series, .....                                                                         | 2·6,   | 2·85  |
| Breadth of palate between last molars, .....                                                               | 1·63,  | 1·69  |
| „ between anterior premolars, .....                                                                        | 1·13,  | 1·0   |
| „ of the fossa between the pterygoid processes, .....                                                      | 0·5,   | 0·75  |
| Greatest width of skull at posterior border of orbit, .....                                                | 5·3,   | 5·6   |
| Length of horns along the curve, .....                                                                     | 35·75, | 29·5  |
| Circumference of ditto at base, .....                                                                      | 9·0,   | 10    |
| Width from tip to tip of horns in a straight line, .....                                                   | 16·5,  | 5·4   |
| Greatest breadth of horn at base, .....                                                                    | 2·25,  | 2·15  |
| Greatest depth of horn at base, .....                                                                      | 3·25,  | 3·25  |
| Width of forehead between orbits, .....                                                                    | 3·5,   | 3·8   |

The lower part of the forehead at the nasal suture and the whole of the frontals are more raised and convex than in either *O. cycloceros*, or *O. Vignei*.

The frontal ridge between the bases of the horns is less developed in *O. Blanfordi*, and in this latter the posterior convex margin of the bony palate is differently shaped, being more pointed and not nearly semicircular as in *O. cycloceros*.

Although this was promised me, I have not, I regret to say, as yet received any skin of this sheep; but I should hope that the dimensions above given, accompanied by an accurate drawing, would suffice to enable other observers to identify this supposed new species.



XVII.—*Catalogue of the recorded Cyclones in the Bay of Bengal, up to the end of 1876, compiled by HENRY F. BLANFORD, Meteorological Reporter to the Government of India.*

The following list was drawn up with a view to ascertaining with greater accuracy than had previously been practicable, what is the distribution of cyclones at the different seasons of the year, and also what parts of the Bay are most liable to storms, in each season of the year. The general results arrived at on these heads have been announced in my lately published work "*The Indian Meteorologist's Vade Mecum*."

The basis of the present catalogue has been furnished by the two lists published by Dr. Buist in Vols. xii and xiv, of the Transactions of the Bombay Geographical Society, and that given by Mr. Piddington in the Sailor's Horn Book,\* accompanying a chart of the storm tracks. To these I have added a considerable number of storms, notices of which I have gathered from other sources, and also those recorded in recent years in the Reports of the Meteorological Department. A few evident errors in Dr. Buist's catalogues (possibly arising from misprints) have been corrected, and attention has been drawn to some doubtful cases.

The several authorities referred to are designated in the Catalogue by the following symbols :

- B. I. Buist's first catalogue. Trans. Bombay Geog. Soc. Vol. xii. App. A.  
 B. II. ditto second ditto ditto ditto ditto ditto xiv. p. 19.  
 P. I-XXV. Piddington's Memoirs in Journ. As. Soc. Bengal.  
 PHB. ditto Sailor's Horn Book of Storms.  
 AAR. Asiatic Annual register.  
 O. Orme's History of the Military transactions in Hindostan.  
 C. Capper's Winds and Monsoons.  
 HD. Horsburgh's Indian Directory. Taylor's Edit. 1871.  
 G. & T. Goldingham and Taylor. Madras Met. Register 1822-1843.  
 SGMA. Surveyor General's Meteor. Abstracts for Calcutta 1840-77.  
 MJ. Madras Journal.  
 L. Dr. Liebeg in the J. As. Soc. Bengal 1858.  
 PRS. Proc. Royal Soc. London.  
 BMR. Bengal Meteorological Reports.  
 G. & B. Gastrell and Blanford. Report on Calcutta Cyclone 1864.  
 W. Rep. W. G. Willson's Special Reports on Cyclones.  
 E. Rep. J. Eliot's ditto ditto ditto.  
 Auct. The Author from private notes.  
 AJ. Asiatic Journal.  
 T. Col. Thuillier in Journ. As. Soc. Bengal. Vol. xvii. p. I.

\* Also in Vol. xvi, part 2 of the Journal of the Asiatic Society of Bengal.

| No.  | Days.                                                       | Details of Storm.                                                                                                                                                                                                                                                     | Authority.                          |
|------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| I    | 1737 <sup>2</sup> Oct. \| 7th                                | A violent earthquake and furious hurricane at the mouth of the Ganges; reached 60 miles up the river. 20,000 craft of all descriptions destroyed. 300,000 people said to have perished in Lower Bengal or in the Gulf. The river rose 40 feet above its usual level.* | PHB. p. 225.                        |
| II   | 1747 <sup>1</sup> Oct. \| 2nd                                | Six French men of war blown out of Madras roads by a hurricane; one foundered and 4 dismasted. Twenty other vessels driven ashore or lost at sea. Storm not felt at Pondicherry.                                                                                      | O.<br>C. p. 57. B.                  |
| III  | 1749 <sup>1</sup> Apr. \| 13th                               | A furious hurricane on the Coromandel Coast. English camp at Porto Novo blown down. Two Indiamen stranded. The <i>Apollo</i> hospital ship, <i>Pembroke</i> 60 guns, and <i>Namur</i> 74 lost.                                                                        | O.<br>C. p. 62.                     |
| IV   | 1752 <sup>1</sup> Oct. \| 31st                               | Violent hurricane on the coast of Madras. Rain that fell continuously for several days laid the whole country under water.                                                                                                                                            | O.<br>C. p. 58.                     |
| V    | 1760 <sup>1</sup> Dec. 31st &<br>1761 <sup>1</sup> Jan. 1st | Cyclone at Pondicherry during the siege. Central calm passed over the town at of New Year's eve.                                                                                                                                                                      | O.<br>C. p. 58.                     |
| VI   | 1763 <sup>1</sup> Oct. \| 21st                               | Madras. All vessels at anchor in the roads lost.                                                                                                                                                                                                                      | C. p. 59.                           |
| VII  | 1768 <sup>1</sup> Oct. \| 29th                               | Madras. <i>Chatham</i> Indiaman lost in the roads. Storm not felt at Pondicherry.                                                                                                                                                                                     | C. p. 60.                           |
| VIII | 1782 <sup>1</sup> Oct. \| 20th                               | Madras. More than one hundred country vessels stranded.                                                                                                                                                                                                               | HID.                                |
| IX   | 1787 <sup>1</sup> May \| 19th &<br>20th.                     | Great storm and storm wave inundation at Coringa; penetrated 20 miles inland. Estimated that 20,000 souls and 500,000 cattle perished.                                                                                                                                | AAR. 1788.<br>PHB. p. 195.<br>B. I. |

\* These estimates are in all probability greatly exaggerated, as will readily be believed by any person acquainted with the character of Indian statistics, even at the present day. The loss of life in the Backergunge cyclone of November 1876, was eventually found to be only about half the original estimate, although this latter was based on an actual enumeration of a certain number of villages, and had been framed with comparative caution.

| No.   | Days.                     | Details of Storm.                                                                                                                                                    | Authority.                    |
|-------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| IX    | 1789 Dec. \| ? | A great storm wave inundation at Coringa. Accounts collected by M. de la Placo in 1840. [Perhaps the same as the preceding. H. F. B.]                                | PHB.                          |
| X     | 1792 Oct. \| 26th & 27th.  | At Madras. No details given.                                                                                                                                         | B. I.                         |
| XI    | 1797 June \| 18th to 20th. | At Madras. No details.                                                                                                                                               | B. I.                         |
| XII   | 1797 Nov. \| ? | In north of Bay. Recorded by H. C. S. <i>Minerva</i> .                                                                                                               | PHB.                          |
| XIII  | 1800 Oct. \| 19th.         | Furious hurricane and earthquake at Ongole and Masulipatam. Many houses at Ongole shaken down.                                                                       | B. I.<br>PHB. p. 226.         |
| XIV   | 1800 Oct. \| 28th.         | Hurricane at Coringa and Masulipatam.                                                                                                                                | B. I.<br>PHB.                 |
| XV    | 1803 Dec. \| 4th.          | H. M. S. <i>Centurion</i> experienced a violent hurricane between Trincomalee and Madras.                                                                            | IID.                          |
| XVI   | 1805 Jan. \| 7th.          | At Trincomalee and on Coromandel Coast and across peninsula to Tellicherry on the Malabar Coast.                                                                     | AAR. 1803.<br>B. I.           |
| ?     | 1805 Mar \| 16th.          | Calcutta and Lower Bengal [Doubtful if this were a cyclone from the Bay. H. F. B.]                                                                                   | B. I.                         |
| XVII  | 1807 Dec. \| 10th & 11th.  | Madras. The sea breached the fort and walls of the Black town. Storm not felt to north of Puliicat, nor at Pondicherry.                                              | B. I.<br>IID.<br>AAR. x. 129. |
| XVIII | 1808 Sept. \| 5th & 6th.   | Cyclone at Vizagapatam. 20 country ships driven on shore.                                                                                                            | AAR. x. 153.                  |
| ?     | 1808 Dec. \| 12th.         | Madras and South Coromandel Coast. Great loss of life and shipping. [Probably a mistake, being a repetition of XVII H. F. B.].                                       | B. I.                         |
| XIX   | 1811 May \| 3rd.           | Madras. Destroyed nearly every vessel in the roads. Ninety native vessels wrecked. The <i>Dover</i> frigate and store ship <i>Manchester</i> run ashore and wrecked. | B. I.<br>IID.                 |
| XX    | 1818 Oct. \| 23rd & 24th.  | Madras. Centre of cyclone passed over the town.                                                                                                                      | B. I.<br>AJ. May 1819.        |
| XXI   | 1820 Mar. \| 29th & 30th.  | Madras [and Kistnapatam ?]                                                                                                                                           | B. I. PHB. p. 55.             |

| No.    | Year. | Month. | Days.           | Details of Storm.                                                                                                                                                                                        | Autho-<br>rity.                                |
|--------|-------|--------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| XXII   | 1820  | May    | 8th.            | Madras and also on Malabar coast. Occasioned some loss of shipping south of Bombay.                                                                                                                      | B. i.<br>PHB. p.<br>56, 95.                    |
| XXIII  | 1822  | June   | ?               | Storm waves swept over Burisal and Backergunj. 50,000 souls said to have perished. Storm travelled only 53 miles in 24 hours.                                                                            | B. i.<br>PIIB p.<br>56.                        |
| XXIV   | 1823  | May    | 26th.           | From the north of the Bay over Balasore. The <i>Liverpool</i> and <i>Oracabessa</i> storm. Six large ships wrecked.                                                                                      | B. i.<br>PIIB p.<br>56.                        |
| XXV    | 1823  | June   | 2nd.            | Chittagong and Delta of Ganges.                                                                                                                                                                          | B. i.                                          |
| XXVI   | 1824  | June   | 8th.            | Chittagong. Heavy inundations causing immense loss of life and property.                                                                                                                                 | B. i.<br>P. XXII.                              |
| XXVII  | 1827  | May    | 7th to<br>10th. | Madras. Several native vessels driven on shore, and the <i>David Scott</i> parted her chain cables. Lowest bar. at Madras 29·76.                                                                         | G. & T.<br>.                                   |
| XXVIII | 1830  | May    | 26th.           | Cyclone apparently passed at sea northwards. A fresh or light gale at Calcutta. Lowest bar 29·008.                                                                                                       | T.                                             |
| XXIX   | 1830  | Dec.   | 2nd.            | A gale of the most violent description at Pondicherry and Cuddalore, whereby the stoutest trees were laid low, houses unroofed and many lives lost. At Madras, wind approached to a gale at 8 or 9 p. m. | G. & T.                                        |
| XXX    | 1831  | Oct.   | 31st.           | Balasore and Cuttack. Inundation swept away 300 villages and at least 11,000 people. Famine followed and total loss of life estimated at 50,000 souls.                                                   | B. i., PII<br>B. p. 56.<br>AJ. 1832<br>& 1833. |
| XXXI   | 1831  | Dec.   | 6th.            | Pondicherry and Cuddalore. Lasted a few hours only but fearfully destructive.                                                                                                                            | B. i.                                          |
| XXXII  | 1832  | May    | 21st.           | In Gangetic delta 8000 or 10,000 people drowned.                                                                                                                                                         | B. i.                                          |
|        | 1832  | Aug.   | 4th.            | Furious hurricane at Calcutta. Bar. 28·8 [not mentioned in Col. Thuillier's list of storms at Calcutta; possibly an error for that of 3rd August 1834. H. F. B.]                                         | B. i.                                          |

| No.          | Month. | Days.         | Details of Storm.                                                                                                                                                                                                                                                                                                                                                         | Authority.              |
|--------------|--------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| XXXIII 1832  | Oct.   | 7th.          | A fresh or light gale at Calcutta.                                                                                                                                                                                                                                                                                                                                        | T.                      |
| XXXIV 1833   | May    | 21st.         | At mouth of Hooghly. H. C. S. <i>Duke of York</i> stranded on a paddy field $2\frac{1}{2}$ miles south of Hidjillee. Bar. at Calcutta 29.032. Storm did not reach to Balasore.                                                                                                                                                                                            | TB. i. PHB. p. 56, 273. |
| XXXV 1834    | May    |               | At Khyouk Phyoo on Arakan coast.                                                                                                                                                                                                                                                                                                                                          | PHB.                    |
| XXXVI 1834   | Aug.   | 3rd.          | At Calcutta blow a gale with incessant rain. Bar. 29.028. Rain 5.30 ins.                                                                                                                                                                                                                                                                                                  | T.                      |
| XXXVII 1836  | Oct.   | 30th.         | Madras. Central calm passed over the town and lasted a quarter of an hour. Lowest bar. 28.285.                                                                                                                                                                                                                                                                            | G & T. B i. PHB. p. 56. |
| XXXVIII 1838 | Oct.   | 19th.         | At Kedjiri in the Hoogly estuary. Bar. at Calcutta 29.398.                                                                                                                                                                                                                                                                                                                | T. [56. PHB. p.         |
| XXXIX 1838   | Nov.   |               | At Khyouk Phyoo.                                                                                                                                                                                                                                                                                                                                                          | PHB. p.                 |
| XL 1839      | June   | 3rd to 5th.   | Traversed the top of the Bay from ENE to WSW. ?<br>[This course seems very doubtful. On the data given, I should put the centre on the 3rd and 4th in positions very different from those adopted by Mr. Piddington. The course was more probably from SE to NW to near Pooree. Prof. Dove has been misled by the original error. See Klimat. Beitr. i. p. 213. H. F. B.] | P. i. [56. PHB. p.      |
| XLI 1839     | Sept.  | 19th to 21st. | Passed northward across Sunderbuns, between Calcutta and Burrisaul, to near Rungpore. Lowest bar. at Calcutta 29.200 with N. wind.                                                                                                                                                                                                                                        | P. ii. T.               |
| XLII 1839    | Nov.   | 12th to 17th. | Across the Bay from the Andamans to Coringa. A storm wave laid the shore 8 ft. under water. 70 vessels and 700 souls lost at sea. 6,000 said to have been drowned on shore.                                                                                                                                                                                               | P. ii. B. i.            |
| XLIII 1840   | April  | 27th to 1st.  | Andamans to the Orissa coast. Felt at Calcutta, where lowest bar. was 29.42. Centre passed just South of Pooree.                                                                                                                                                                                                                                                          | P. iii. B. i. T. i.     |

| No.    | Year. | Month.       | Days.            | Details of Storm.                                                                                                                                                                                                                     | Authority.                  |
|--------|-------|--------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| • XLIV | 1840  | May          | ?                | Hurricane off Madras and Southern coast.                                                                                                                                                                                              | B. i.                       |
| XLV    | 1840  | Nov.         | 21st.            | To the NE of Andamans.                                                                                                                                                                                                                | P. ii.                      |
| XLVI   | 1841  | May          | 16th.            | From the SW of the Andamans to Madras. A lull in the middle of the storm at Madras Bar. 29·069.                                                                                                                                       | P. v.<br>G. & T.<br>B. i.   |
| XLVII  | 1842  | May<br>June  | 31st to<br>5th.  | Great Calcutta cyclone on 3rd June. "The most severe gale ever felt at Calcutta." Bar. 28·278. Centre passed over the city.                                                                                                           | P viii. T<br>SGMA.<br>B. i. |
| XLVIII | 1842  | Oct.         | 2nd to<br>5th.   | Across the north of the Bay, in a NW direction to Cuttack. Also felt at Gya and Patna on the 6th.                                                                                                                                     | P ix.<br>B. i.              |
| XLIX   | 1842  | Oct.<br>Nov. | 22nd to<br>1st.  | From the Andamans westward to Pondicherry and across India to the Arabian Sea. Thence westward to E. Long. 60° a total course of 2000 miles. Average rate of travelling 12·4 miles per hour across the bay, and 5·6 miles afterwards. | P viii.<br>B. i.            |
| L      | 1843  | May          | 19th to<br>23rd. | From South of bay, NW to Ongole. Bar. at Masulipatam 28·73. The place inundated by the sea. Bar. at Bombay fell 0·2 from 18th to 23rd.                                                                                                | P x.                        |
| LI     | 1843  | Nov.<br>Dec. | 28th to<br>2nd.  | From N. lat. 6° E. long. 90° in NW direction. Did not reach land. Another storm simultaneously in lat. 7°—8° and same long, south of the equator.                                                                                     | P xi.                       |
| LII    | 1844  | May          | 11th.            | Noakhally and Chittagong.                                                                                                                                                                                                             | P xii.                      |
| LIH    | 1844  | Aug.         | 21st.            | Blowing a gale at Calcutta from 9 p. m. to the following morning. More than 12 ins. of rain fell. Bar. at sunset, before the gale 29·350. [Not mentioned by Piddington but appears to have been a cyclone. H. F. B.]                  | T.<br>SGMA.                 |

| No.   | Month. | Days.                  | Details of Storm.                                                                                                                                                                          | Authority.         |
|-------|--------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| LIV   | 1844   | Nov. 9th to 14th.      | East of the Andamans. Encountered by the <i>Briton</i> and <i>Runnymede</i> troop ships. Both dismasted and thrown on Andamans.                                                            | XII.               |
| LV    | 1845   | Nov. 29th to Dec. 2nd. | From South of bay, westward to Ceylon. Centre passed near Batticula. On the 3rd a magnetic storm observed at Bombay.                                                                       | XIV.<br>B. I.      |
| LVI   | 1846   | Sept. 21st.            | A gale at night at Calcutta. Bar. T. at sunset before gale 29.475.                                                                                                                         | SGMA.              |
| LVII  | 1848   | April 23rd.            | Violent hurricane off Ceylon, in which H. M. brig <i>Junna</i> was nearly lost.                                                                                                            | B. I.              |
| LVIII | 1848   | July 15th.             | Sandheads. Ship <i>Nussur</i> foundered.                                                                                                                                                   | P. XXII.           |
| LIX   | 1848   | Oct. 12th to 14th.     | In north of Bay where it was generated. Travelled NW to False Point. Centre passed over light-house.                                                                                       | P. XVIII.          |
| LX    | 1849   | May 12th to 13th.      | Chittagong. Lowest (used) Bar. 28.40.                                                                                                                                                      | P. XXII.           |
| LXI   | 1849   | Dec. 10th.             | Severe hurricane at Madras. Ships <i>Lady Sale</i> , <i>Industry</i> and <i>Princess Royal</i> lost.                                                                                       | B. I.              |
| LXII  | 1850   | April 23rd to 28th.    | Cyclone formed to west of Nicobars passed northward to Bengal, between Midnapore and Calcutta and over Moorshedabad, on nearly the same track as that of 1864, but a little more westerly. | P. XX.             |
| LXIII | 1850   | Nov. 17th to 19th.     | In Andaman Sea. Formed east of Port Blair and travelled NNW.                                                                                                                               | P. XXII.           |
| LXIV  | 1850   | Dec. 4th.              | Hurricane at Madras. Two ships and 18 country craft wrecked.                                                                                                                               | B. I.              |
| LXV   | 1851   | April 30th to May 6th. | From the NE of Ceylon to Madras. Passed to north of town. Lowest bar. 29.322 with wind from SW.                                                                                            | P. XXI.<br>B. I.   |
| LXVI  | 1851   | Oct. 20th to 23rd.     | In north of Bay. Centre passed over False Point light-house and thence NE by N. in direction of Dacca. Lowest bar. at False Point 28.21.                                                   | P. XXIII.<br>B. I. |

| No.     | Year. | Month.                 | Days.         | Details of Storm.                                                                                                                                                             | Authority.             |
|---------|-------|------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| LXVII   | 1852  | May                    | 12th to 15th. | From lat. 15° course due North to Sunderbuns. Centre passed 39 miles East of Calcutta. Two river steamers in Sunderbuns carried to middle of jungle. Much damage in Calcutta. | P. xxiv.<br>B. i.      |
| LXVIII  | 1853  | Mar.                   | 26th to 28th. | Furious hurricane in Southern India. Some 50 vessels sunk or wrecked on the Coromandel coast, South of Madras.                                                                | B. i.                  |
| LXIX    | 1854  | April                  | 21st to 23rd. | A violent hurricane in Gulf of Martaban and at Rangoon.                                                                                                                       | P. xxv.<br>B. i.       |
| LXX     | 1854  | Oct.                   | 6th.          | Hurricane South of Ceylon.                                                                                                                                                    | B. i.                  |
| LXXI    | 1855  | May                    | 15th to 29th. | Bay of Bengal between Burmah and Madras.                                                                                                                                      | B. ii.                 |
|         | 1856  | May                    | 14th.         | In Bay of Bengal. [This rests on Buist's authority only. A gale is recorded at Calcutta on this day, but it was only a violent hail-storm. H. F. B.]                          | B. ii.<br>SGMA.        |
| LXXII   | 1856  | Sept.                  | 3rd.          | Calcutta Lowest bar. 29.156.                                                                                                                                                  | SGMA.                  |
| LXXIII  | 1856  | Nov.                   | 17th to 21st. | Bay of Bengal 5° to 20° North. Felt at Madras.                                                                                                                                | B. ii.<br>MJ. 1856     |
| LXXIV   | 1857  | Oct. 28th to Nov. 2nd. |               | Off Ceylon. Central calm passed over Nellore. Many houses and trees blown down.                                                                                               | B. ii.<br>MJ.<br>1857. |
| LXXV    | 1858  | April                  | 9-10th.       | From Andamans to Cape Negrais. Much destruction at Henzada and Rangoon, between which the centre passed.                                                                      | L.<br>B. ii.           |
| LXXVI   | 1858  | May                    | 15th to 20th. | Bay of Bengal across to Malabar coast. Also Chittagong at Dacca.                                                                                                              | B. ii.                 |
| LXXVII  | 1858  | Oct.                   | 25th & 26th.  | At Calcutta. Lower bar. 29.291.                                                                                                                                               | B. ii.<br>SGMA.        |
| LXXVIII | 1859  | April                  | 21st to 27th. | Bay of Bengal and also the Andaman Sea. Prevailed with greatest violence in the neighbourhood of Negapatam. 15 to 20 inches rain over Tanjore.                                | B. ii.<br>MJ. iv.      |
| LXXIX   | 1859  | June                   | 12th to 17th. | Bay of Bengal off Akyab.                                                                                                                                                      | B. ii.                 |
| LXXX    | 1859  | July                   | 25th to 27th. | Calcutta. Lowest bar. 28.179. Incessant rain. No thunder or lightning.                                                                                                        | B. ii.<br>SGMA.        |

| No.      | Year. | Month.    | Days.         | Details of Storm.                                                                                                                                                                                                                                                                                                            | Authority.         |
|----------|-------|-----------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| LXXXI    | 1864  | Oct.      | 2nd to 5th.   | From NW of Andamans to Bengal. Storm wave in Hooghly swept away 48,000 souls and upwards of 100,000 cattle. Nearly all the shipping in the river stranded. P. and O. mail steamers <i>Bengal</i> and <i>Bentinck</i> hulk landed high and dry on fields. All trees stripped of their leaves. Lowest bar. at Calcutta 28.570, | G. & B.            |
| LXXXII   | 1864  | Oct.      | 25th.         | North of Bay of Bengal.                                                                                                                                                                                                                                                                                                      | G. & B.            |
| LXXXIII  | 1864  | Nov.      | 5th.          | Masulipatam Cyclone.                                                                                                                                                                                                                                                                                                         | G. & B.            |
| LXXXIV   | 1865  | Nov.      | ?             | E. of Ceylon.                                                                                                                                                                                                                                                                                                                | G. & B.            |
| LXXXV    | 1867  | Sept.     | 30th.         | Vizagapatam Cyclone.                                                                                                                                                                                                                                                                                                         | Auct.              |
| LXXXVI   | 1867  | Oct. Nov. | 27th to 2nd.  | From near Nicobars to Bengal. Passed East of Calcutta over Port Canning.                                                                                                                                                                                                                                                     | BMR. PRS.          |
| LXXXVII  | 1867  | Nov.      | 12th.         | In north-east of bay.                                                                                                                                                                                                                                                                                                        | Auct.              |
| LXXXVIII | 1868  | Nov.      | ?             | Cyclone at Akyab.                                                                                                                                                                                                                                                                                                            | Auct.              |
| LXXXIX   | 1869  | May       | 1st.          | In NE of Bay. <i>Moulmein</i> steamer involved.                                                                                                                                                                                                                                                                              | BMR. 1869.         |
| XC       | 1869  | May       | 13th to 17th. | From Cape Negrais to NW across Bengal.                                                                                                                                                                                                                                                                                       | BMR. 1869.         |
| XCI      | 1869  | June      | 5th to 10th.  | North of Bay and across Bengal.                                                                                                                                                                                                                                                                                              | BMR. 1869.         |
| XCII     | 1869  | Oct.      | 7th & 8th.    | From NE of bay, across Midnapore, Purulia and Gya to Benares.                                                                                                                                                                                                                                                                | BMR. 1869.         |
| XCIII    | 1870  | Jan.      | 10th & 11th.  | South of bay, midway between Ceylon and Nicobars.                                                                                                                                                                                                                                                                            | BMR. 1870.         |
| XCIV     | 1870  | May       | 30th.         | In NE of bay. Encountered by steamer <i>Moulmein</i> .                                                                                                                                                                                                                                                                       | BMR. 1870.         |
| XCV      | 1871  | ?         | ?             | Near Pondicherry.                                                                                                                                                                                                                                                                                                            | BMR.               |
| XCVI     | 1872  | April May | 29th to 3rd.  | Severe cyclone passed over Madras. Formed about 7° 30' N. lat. Felt at Calicut and affected the barometer at Bombay.                                                                                                                                                                                                         | 1871. BMR. 1872.   |
| XCVII    | 1872  | June July | 28th to 1st.  | A small storm generated in the north of the bay passed over Balasore.                                                                                                                                                                                                                                                        | W. Rep. BMR. 1872. |
| XCVIII   | 1872  | Sept.     | 11th.         | A small local cyclone in NE of Bay.                                                                                                                                                                                                                                                                                          | BMR. 1872.         |
| XCIX     | 1872  | Sept.     | 19th & 20th.  | From north of bay, northwards across Jessore.                                                                                                                                                                                                                                                                                | BMR. 1872.         |
| C        | 1872  | Oct.      | 24th to 26th. | Cyclone passed over Narcondam island levelling the forest.                                                                                                                                                                                                                                                                   | BMR. 1872.         |

| No.   | Ye   | Month.                 | Days.         | Details of Storm.                                                                                                                                                     | Autho-<br>rity.    |
|-------|------|------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| CI    | 1873 | Nov.                   | 3rd.          | Severe cyclone encountered by the <i>Foam</i> in N. lat. $15^{\circ} 30'$ , E. long. $85^{\circ}$ .                                                                   | BMR. 1873.         |
| CII   | 1874 | May                    | 3rd to 5th.   | Cyclone at Madras. Originated about N. lat. $9^{\circ}$ , E. long. $85^{\circ}$ . Broke up before reaching land.                                                      | BMR. 1874.         |
| CIII  | 1874 | June                   | 15th to 17th. | Small cyclone in NW of bay.                                                                                                                                           | BMR. 1874.         |
| CIV   | 1874 | July                   | 28th & 29th.  | An incipient cyclone in NW of bay.                                                                                                                                    | BMR. 1874.         |
| CV    | 1874 | Aug.                   | 1st & 2nd.    | Crossed the north of the bay from near Akyab to WNW.                                                                                                                  | BMR. 1874.         |
| OVI   | 1874 | Oct.                   | 13th to 16th. | Originated between $13^{\circ}$ and $17^{\circ}$ N. lat. Crossed to NW of bay and passed over Midnapore and Burdwan. Bar. at Sandheads in central calm $27.58$ .      | W. Rep. BMR. 1874. |
| CVII  | 1874 | Oct.                   | 24th to 26th. | Cyclone felt at Coconada.                                                                                                                                             | BMR. 1874.         |
| CVIII | 1874 | Nov.                   | 1st & 2nd.    | Second cyclone at Coconada. Did not reach land.                                                                                                                       | BMR. 1874.         |
| CIX   | 1874 | Nov.                   | 10th to 12th. | Encountered by Meinam between lat. $17^{\circ}$ and $19^{\circ}$ .                                                                                                    | BMR. 1874.         |
| CX    | 1874 | Dec.                   | 10th to 12th. | Storm in the South of the bay.                                                                                                                                        | BMR. 1874.         |
| CXI   | 1876 | Oct.                   | 5th to 8th.   | Vizagapatam cyclone. Found to West of Andamans in N. lat. $15^{\circ}$ , reached Vizagapatam on 8th and passed up the margin of East                                  | J.E. Rep.          |
| CXII  | 1876 | Oct. 29th to Nov. 1st. |               | The Backerganj cyclone. Formed near Andamans and moved north to mouth of Megna, the islands of which were swept by storm wave, and upwards of 100,000 people drowned. | J.E. Rep.          |



XVIII.—*Memorandum on the diurnal Variation of Atmospheric Pressure at the Sandheads, by CHAS. HARDING, Esq., with a prefatory note by HENRY F. BLANFORD.*

In the Society's Journal, Part II, No. 1 of 1877, I published a short paper on the Variation of the Barometric Tides in connection with the Diurnal Land and Sea-breezes, in which the diurnal variation of pressure over the Bay of Bengal between latitude  $20^{\circ}$  and the Sand-heads, in the month of January, was deduced from the ship observations recorded in the log-books collected by the London Meteorological Office. The method pursued in dealing with these observations was a very rough one, and by no means the best that might have been adopted; and I assumed (what I now admit was not justified) that the observations dealt with were sufficiently numerous to yield mean values for each hour of observation which should be comparable with each other.

A few weeks ago I received from Captain H. Toynbee, the Superintendent of Marine Meteorology in the London Meteorological Office, the following Memorandum, which was drawn up at his request by Mr. Chas. Harding, and as it furnishes an important correction to the results given in my paper above referred to, I have much satisfaction in communicating it to the Society.

H. F. B.

In glancing through Mr. Blanford's paper on the Variation of the Barometric Tides in connection with diurnal land and sea-breezes I was much struck by the diagram on p. 48, which shows the afternoon minimum, deduced from the sea observations, to be considerably less marked than the morning minimum; and from para. 2, p. 47, I gather that the pith of the paper depends greatly upon the shallowness of this afternoon minimum.

The discussion of the diurnal range of barometer observations at sea, in the neighbourhood of the equator, in the North Atlantic, (see Official No. 20, published by the Meteorological Office) in no way supports this excess of depression in the morning minimum, and the experience derived from that discussion has suggested to me a probable cause of much of the difference exhibited by Mr. Blanford.

I rather fail to reproduce the mean results given by Mr. Blanford, but I see sufficient to warrant me in inferring that whatever observations he has allowed to enter into the discussion have been summed up as follows: if the part of the ocean under discussion yielded sixty-four noon observations, thirty-eight 4 P. M. observations, &c., the sixty-four noon observations were meaned and the mean compared with the mean of the thirty-eight 4 P. M. observations.

I have quite ignored that I might refer to the original logs, and have considered myself restricted to the observations as given in the "Data

Books" and have dealt with the observations obtained from that source in a manner which as far as I can see is open to very little objection, and which is probably the best possible method under the circumstances.

I have meaned all the noon observations for an absolute reading, and for the means of the other 4-hourly periods have worked on the absolute differences which are obtainable from the various observations recorded: for example, working all the obtainable differences of 4 P. M. observations on noon observations for the same day, and finally meaning these differences, and applying the mean difference to the noon mean already obtained for a 4 P. M. mean:—so on for all the other 4-hourly periods. The method has been to take noon as a centre and work on differences at each side of it. The midnight observation has thus been obtained, by working backwards and forwards from noon, and the difference of the two results is only ·002 in.

The results for the 4-hourly periods are as follows, using all the sea data between 20° and 22° N. and 80° to 90° E.

| 4 A. M. | 8 A. M. | Noon.  | 4 P. M. | 8 P. M. | Midt.  | Mean.                    |
|---------|---------|--------|---------|---------|--------|--------------------------|
| 29·996  | 30·056  | 30·041 | 29·987  | 30·029  | 30·024 | 30·022                   |
| —·026   | +·034   | +·019  | —·035   | +·007   | +·002  | { diff. from<br>Daily M. |

I have computed Bessel's constants from the 4-hourly values, and the expression is as follows:—

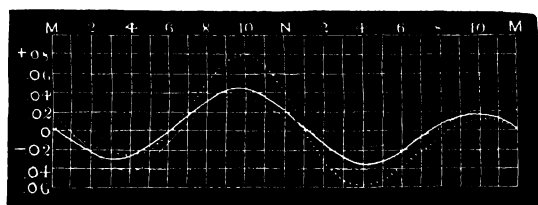
$$x = 30·022 + ·0136 \sin (n. 15^\circ + 320^\circ 5') + ·0311 \sin (n. 30^\circ + 160^\circ 42') \\ + ·0002 \sin (n. 45^\circ + 90^\circ).$$

From the constants, the following hourly values for the sea observations have been computed: they are given side by side with the hourly values of sea observations deduced by Mr. Blanford and with those of Calcutta.

| Hour.   | Calcutta. | Sea [C. H.] | Sea [Mr. Blanford.] |
|---------|-----------|-------------|---------------------|
|         | 30·011    | 30·022      | 30·022              |
| Midt.   | +·003     | +·002       | +·016               |
| 1 A. M. | —·006     | —·011       | —·001               |
| 2 "     | —·015     | —·023       | —·021               |
| 3 "     | —·021     | —·028       | —·037               |
| 4 "     | —·024     | —·026       | —·012               |
| 5 "     | —·020     | —·016       | —·033               |
| 6 "     | —·005     | ·000        | —·013               |
| 7 "     | +·021     | +·018       | +·010               |
| 8 "     | +·050     | +·034       | +·028               |
| 9 "     | +·072     | +·043       | +·037               |
| 10 "    | +·078     | +·043       | +·035               |
| 11 "    | +·062     | +·035       | +·024               |

|         |        |        |        |
|---------|--------|--------|--------|
| Noon    | + ·032 | — ·019 | — ·011 |
| 1 P. M. | — ·002 | ·000   | — ·001 |
| 2 "     | — ·031 | — ·018 | — ·010 |
| 3 "     | — ·048 | — ·031 | — ·014 |
| 4 "     | — ·054 | — ·035 | — ·016 |
| 5 "     | — ·051 | — ·031 | — ·016 |
| 6 "     | — ·040 | — ·021 | — ·014 |
| 7 "     | — ·024 | — ·007 | — ·008 |
| 8 "     | — ·007 | + ·007 | + ·002 |
| 9 " .   | + ·006 | + ·016 | + ·014 |
| 10 "    | + ·012 | + ·018 | + ·023 |
| 11 "    | + ·010 | + ·013 | + ·024 |

The above observations are plotted in the following diagram.



Thick line—Sandheads. (C. H.)

Thin „ do. (H. F. B.)

Dotted „ Calcutta.

I have worked the values of the 4-hourly periods for the belts of latitude, from 20° to 21° N. and 21° to 22° N., as well as the combined result, consequently give them below.

| 4 A. M. | 8 A. M. | Noon.  | 4 P. M. | 8 P. M. | Midt.  | Mean.                       |                                                                     |
|---------|---------|--------|---------|---------|--------|-----------------------------|---------------------------------------------------------------------|
| 30·005  | 30·063  | 30·047 | 29·991  | 30·033  | 30·025 | 30·027                      | 20° to 21°                                                          |
| — ·022  | + ·036  | + ·020 | — ·036  | + ·006  | — ·002 | { Diff. from<br>Daily Mean. | N.                                                                  |
| 29·977  | 30·031  | 30·021 | 29·973  | 30·013  | 30·013 | 30·005                      | { 21° to 22°<br>N reject-<br>ing excep-<br>tional read-<br>ing—158. |
| — ·028  | + ·026  | + ·016 | — ·032  | + ·008  | + ·008 | { Diff. from<br>Daily Mean. |                                                                     |

The main reasoning of Mr. Blanford's paper is only affected in so far as the amount of difference, on which the reasoning is based, is considerably lessened.

I venture the above remarks as I gather from Mr. Blanford's paper that he intends eventually dealing with the other months in a similar manner.

The results given by me have not been thoroughly checked for want of time.

London, 9th October, 1877.

CHARLES HARDING.

XIX.—*Notes on Phasmidæ.*—By J. WOOD-MASON.

(With Plates II and III.)

## MENAKA SCABRIUSCULA.

*Bacillus scabriusculus*, Wood-Mason, J. A. S. B., 1873, Vol. xlii, pt. ii, p. 55, pl. viii, fig. 1, ♀.

*Sthenoboea Brunneri*, Stål, Recensis Orthopt. III, 1875, p. 69, ♀.

*Menaka scabriuscula*, Wood-Mason, MS.

I have seen numerous examples of this species in boxes of insects from Silhet, the locality given by M. Stål for his species; but none of them differed sufficiently from those described by me to merit distinction even as a variety.

It is an insect with short and filiform antennæ, and as it differs in this as well as other respects from all the forms with which it has been classed by M. Stål, I here introduce the new generic name that I had proposed for it.

## LONCHODES WESTWOODI.

*Bacillus Westwoodi*, Wood-Mason, J. A. S. B., 1873, Vol. xlii, p. 51, pl. \*, figs. 1, 2; P. A. S. B., 1873; p. 149; and Ann. and Mag. Nat. Hist., 4th Ser., 1873, Vol. xii, p. 348.

*Lonchodes Westwoodi*, id., J. A. S. B., 1875, Vol. xlv, p. 215, ♂.

*Entoria spinicornis*, Stål, Recensis Orthopt. III, 1875, p. 72.

M. Stål's\* *Entoria spinicornis* from Silhet appears to me to be identical with the species described by me from the Andamans. I have since found it in abundance in Calcutta, and have ascertained that it occurs also in Silhet and on Camorta Is., Nicobars.

I have made a number of interesting observations on its habits and anatomy which will be published in due course.

It lives on *Streblus asper*, a shrub or small tree which is indigenous wherever the insect is found.

## BACTERIA SHIVA, Pl. II, Fig. 3, ♂.

*Bacteria Shiva*, Westwood, Monograph of *Phasmidæ*, 1859, p. 32, pl. viii, fig. 6, ♀.

HAB. Westwood gives "North India" as the locality of the female preserved in the National Collection. Lt.-Col. Godwin-Austen has obtained

- I take this opportunity of thanking M. Stål for his friendly transmission of copies of all his memoirs on the *Orthoptera*, including his new '*Systema Phasmodarum*' which, on my return to India, I shall take an early opportunity of comparing with my own materials.

several specimens of both sexes at Shillong, in the North Khasi Hills, and has thus enabled us to give a more precise locality for the species.

I now give a figure of the male, which was unknown to Westwood, but am obliged to reserve my description of it for a future paper.

The species in both sexes runs so very close to a winged species (apparently a variety of *Necroscia Sparaxes*, Westw.) from the same region that it now occurs to me that it may after all be nothing more than an apterous form of it.

#### BACTERIA SINKIEBENSIS, n. sp.

♂ ♀. Differs from *B. Sarawaka*, Westw. ♂ ♀ chiefly in the relative proportions of the different parts of the body.

The following are the measurements of dried specimens of the male and female:—

♂. Total length 32 lines; head 1·75; proth. 1·75; mesoth. 8·75; metath. 4; abd.  $13·25 + 3 = 16·25$ ; antennæ 28·5.

♀. Total length 3 in. 6 lines; head 2·5 lines; proth. 2·25; mesoth. 10·75; metath. 4·25; abd.  $18·5 + 3 = 21·5$ ; antennæ 31·25.

HAB. Sinkieb (Sinkiep?) Island, near Linga Island, off the N. E. coast of Sumatra, a male and a female taken *in copula* by my native collector.

#### LONCHODES AUSTENI, Pl. III, Fig. 4, ♂.

Wood-Mason, J. A. S. B., 1875, Vol. xlv, p. 216, ♂.

HAB. Dikrang valley, Assam.

I have nothing to add to my original description.

#### RHAPHIDERUS CERBERUS.

*Anisomorpha?* *Cerberus*, Westwood, Monograph of *Phasmidæ*, p. 19, pl. I, fig. 6, ♂.

A spirit-specimen of the male, the only sex at present known, measures:—

♂. Total length 2 in. 2·25 lines; head 2·5; proth. 2; mesoth. 4·75; metath. 2·75; abd.  $9·5 + 4·75 = 14·25$  lines.

HAB. Pusalava, Ceylon (*H. Nevill*).

I place the species provisionally in the genus *Rhaphiderus*, because it not nearly approaches *R. scabrosus*, with which it also agrees in its highly polished integument.

#### LONCHODES NEMATODES.

*Phasma (Bacteria) nematodes*, De Haan, Orthopt. Orient. p. 133, pl. xi, fig. 6, ♂, *nom.* pl. xiii, fig. 1, ♀.

*Lonchodes nematodes*, Westwood, Monograph of *Phasmidæ*, p. 42, ♂ only pl. v. fig. 7, ♂.

HAB. Buitenzorg in Java, and Sumatra (♂ *De Haan*); Singapore (♂ *Westwood*); and Perak, Malay Peninsula, whence I have just obtained for the Indian Museum a specimen of the male agreeing in every respect except size, as to which it is slightly inferior, with the specimen in the British Museum from Singapore figured by *Westwood*; it was purchased from a collection of insects formed by one of the medical officers attached to the Perak Expedition.

#### LONCHODES BREVIPES.

- Lonchodes brevipes*, G. R. Gray, Syn. Phasm. p. 19, ♂  
 „ *pterodactylus*, id., op. cit. p. 19, ♀.  
*Phasma (Bacteria) nodosum*, De Haan, Orthopt. Orient. p. 133, pl. xi, fig. 3, ♂.  
 „ *Sumatranum*, id., op. cit. pl. xiii, fig. 6, ♀.  
*Lonchodes brevipes*, *Westwood*, Monograph of *Phasmidæ*, p. 36, ♂ ♀.  
 „ *nodosus*, id., op. cit. p. 37, ♂ ♀.

I have carefully examined and measured the typical specimens of *Gray's* species preserved in the National Collection, but failed to detect the slightest difference between them and *De Haan's* species, of which a multitude of specimens of both sexes was obtained some years ago by my native collector at *Johore\** in the Malay Peninsula and on the island of Singapore immediately opposite. The specimens described by *De Haan* were from Sumatra, those by *Gray* from the Malabar Coast. I have also a specimen of the female presented to me by my late friend *Dr. Stoliczka*, which was said by him to have been brought from Java.

The following are the measurements of two of the typical specimens

\* Similarly, the metallic coloured *Mantis*, of which my native collector obtained numerous examples at this same place, has proved identical with the species (*Metallectica splendida*) described many years ago by *Westwood* from Malabar. The species, like so many other metallic insects (e. g., notably *Chiloloba acuta*, of which fiery red with all the fire of the opal, green, and blue specimens, with all connecting shades, can be collected at *Sahibganj* in a few minutes; *Heterorrhina elegans*, and other *Cetoniidæ*), exhibits the phenomenon of dichroism, the blue (*M. violacea*) being structurally perfectly indistinguishable from those that are green with coppery reflections (*M. splendida*). To place the matter beyond all doubt I submitted specimens of each form for comparison with the type to Professor *Westwood*, who also was unable to detect any difference between them save that of colour.

The larvæ are all coloured, as to their legs and bodies, like the blue form of the imago, thus exhibiting, as appears to me probable, an ancestral phase; and if this be so, then the dimorphism would in this case, at any rate, be interpretable as the retention, throughout life, of larval, that is, ancestral, characters by certain individuals of both sexes; and this may be the true nature of dimorphism in insects in general. But we are as far as ever from understanding what profit or advantage it can be to a species to exist under two or more different forms.

preserved in the British Museum with Gray's own names and the locality (Malabar) still attached to them :—

♂. Total length 4 inches; head 1·75; prothorax 1·75; mesothorax; 13; metathorax 9·25; abdomen 17·75 + 5 = 22·75 (*L. brevipes*).

♀. Total length 4 inches 9 lines; head 3; proth. 2·25; mesoth. 13·25 metath. 10·5; abdom. 22·5 + 6 = 28·5 (*L. pterodactylus*).

The following those of a male and a female from Johore and both preserved in alcohol :—

♂. Total length 4 in. 1·5 lines; head 1·75; proth. 2; mesoth. 13·25; metath. 10; abd. 18 + 1·75 = 22·75; antennæ 28·25 lines.

♀. Total length 5 in. 6·25 lines; head 3; proth. 2·5; mesoth. 15·25; metath. 11·75; abd. 27 + 6·75 = 33·75; antennæ 23·25 lines.

And the following those of the female from Java—also preserved in alcohol :—

♀. Total length 4 in. 6 lines; head 2·5; proth. 2·25; mesoth. 11·75; metath. 9·25; abd. 22·5 + 5·75 = 28·25; antennæ 16·5 lines.

The males in this species have the metathorax curiously curved and in both sexes this segment is so articulated to the mesothorax on each side by interlocking processes as to be capable of movement upwards and forwards upon it through an arc of fully 45°—peculiarities of structure which have not been met with by me in any other species of the family. The highly indurated condition of the whole thoracic integument is also exceptional.

#### LONGIODES SPINICOLLIS.

*Prisomera spinicollis*, G. R. Gray, Syn. Phasmid., p. 16, ♀.

„ *spinicolle*, Westwood, Monogr. Phasid., p. 47, ♀.

? *Lonchodes auscultator*, Bates, Trans. Linn. Soc. Lond., Vol. xxv, p. 334, ♂.

The following are the measurements of a spiral-specimen :—

♀. Total length 4 in. 7·25 lines; head 2·5; proth. 2·25; mesoth. 12; metath. 9·5; abd. 23 + 6 (to end of supra-anal plate) = 29; antennæ 30 lines.

• HAB. Galagedara, near Kandy, Ceylon,\* obtained by Mr. Hugh Nevill, of the Ceylon Civil Service.

\* The importance of exact habitats for species from Ceylon and S. India cannot be too strongly insisted on: 'I have, from both countries, species which must have lived in open parched country with but a scant covering of vegetation like that around Bangalore, Madras, &c., and species which equally certainly are inseparable from the thickest and most luxuriant tropical vegetation, all marked with no more precise locality than 'Ceylon' or 'S. India' or 'Madras.' Animals localized in this unprecise manner are all valuable enough as specimens of the species to which they belong, but they have no higher value.

The specimen agrees perfectly with the type in the British Museum, which however has lost the long and conspicuous supra-anal plate.

There can hardly be a doubt that Bates' *L. auscultator* is the male.

#### LONCHODES CRAWANGENSIS.

*Phasma Crawangense*, De Haan, Orthopt. Orient. pl. xiii, fig. 1, ♀; non pl. xi, fig. 6, ♂.

*Lonchodes nematodes*, Westwood, Monograph of *Phasmida*, p. 42, ♀.

A dried specimen of the female obtained by my native collector at Johore in the Malay Peninsula measures:—

♀. Total length 5 in. 2 lines; head 2; proth. 2·25; mesoth. 15; metath. 11·5; abd. 27·5 + 3·75 (to apex of 10th segment) = 31·25; antennæ 26 lines.

An immature insect closely resembling the female in general structure, and doubtless the opposite sex of the species, was obtained by Mr. W. Davison at Pahpoo, N. of Moulmein: it measures:—

♂ immature. Total length 2 in. 10·25 lines; head 1·5 lines; proth. 1·5; mesoth. 7·75; metath. 6; abd. 15 + 3·25 = 18·25; antennæ 14·5.

#### PHIBALOSOMA ANNAMALAYANUM.

*Phib. Annamalayanum*, Wood-Mason, P. A. S. B., July, 1877, p. 161, ♀.

♀. Very closely allied to *Phib. acanthopus*, from which it differs in its stouter body, its shorter and thicker legs, and in the relative proportions of the different parts of the body, particularly the meso- and meta-thorax.

The following are the measurements of a spirit-specimen:—

Total length 8 inches 9 lines; head 7 lines; mesoth. 19; metath. 16; abd. 3 in. 6·75 lines + 1 in. 2·5 lines = 4 in. 9·25 lines; antennæ 2 in. fore femur 2 in. 2 lines, tibia 2 in. 6 lines; intermediate femur 1 in. 8 lines, tibia 1 in. 8 lines; posterior femur 1 in. 11 lines, tibia 2 in. 1 line.

A lamellar process rounded off at extremity at hinder end of sixth ventral segment of the abdomen.

HAB. Annamallay forests, Southern India, a single specimen preserved in spirits, obtained by Colonel R. C. Beddome, and Travancore Hills, a much mutilated dried example, presented to me by Mr. F. Day.

A characteristically Malayan form; in which, as in *Phib. virgea* and in *Phib. acanthopus*, the female is perfectly apterous, the metanotum proper is much longer than the medial segment, and there is a process\* at the hinder extremity of the sixth ventral segment of the abdomen; and which effects a sort of transition between its more immediate allies above-named and its more remote ones, *Phib. Cantori* and *Phib. Westwoodi*, in which

\* Serving, possibly as actually in *Necrosia sparaxes*, &c., as a *point d'appui* for the forceps of the male in copulation.

the female has minute scale-like rudiments of organs of flight, the metanotum proper about equal to the medial segment, and the hinder extremity of the sixth ventral segment of the abdomen unarmed. In *Phib. virgea* ♂, as I have already pointed out (P. A. S. B., July 1877), the metathoracic and mesothoracic tubercles figured by Westwood are exceedingly minute rudiments of organs of flight; and the same relation of length subsisting between the two divisions of the metathorax in *Phib. acanthopus* and *Phib. Annamalayana* obtains in it (*Phib. virgea*, the male of which we know to be a wingless insect or practically so), I expect that the males of these two species with also prove to be apterous; in which event, then the winged male ascribed to *P. acanthopus* by De Haan, and by Westwood following him, will belong to another species.

With the single exception of *Lonchodes brevipes*, this is the only species of *Phasmidæ* at present known to us from the Malabar Coast and from the hill-tops of Southern India!

*PHIBALOSOMA WESTWOODI*, Pl. III, Fig. 1, ♀.

*Phib. Westwoodi*, Wood-Mason, J. A. S. B., 1875, Vol. xlv, part ii, p. 216, ♀; P. A. S. B., July 1877.

I have examined with Professor Westwood the typical specimens of *P. Cantori* preserved in the Hopeian collection at Oxford and I find that the insects have been legitimately united by their describer; the female having small equal blunt representatives of the conspicuous cephalic tubercles seen in the male; these tubercles not having been represented by Professor Westwood in his figure of the former, I was led to suggest (*loc. supra. cit.*) that *P. Westwoodi*, which had cephalic tubercles, and those of unequal size, might be the opposite sex of *P. Cantori* ♂, the true female of which had been represented as having none. These tubercles are in *P. Cantori* placed further forwards on the disk of the head than in the present species.

*Lopaphus*, (Westwood), W. M.

*Bacteria*, Westwood (p.), *Lonchodes*, Westw. (p.), *Lopaphus*, Westw. (p.) *Necrosia*, Westw. (p.).

In J. A. S. B., Vol. XLIV, Part II, 1875, p. 217, I have described a remarkable insect, obtained by my native collector at Johore, as the female of Westwood's *Necrosia Iolas*, and pointed out the very close relationship of this species to *Lopaphus brachypterus*, *Lonchodes porus*, *L. Bootanicus*, and *Bacteria Baucis*, all of which should find a place in the same genus with it.

M. C. Stål has described the same insect from a Malaccan specimen under the name *Candaules Sparnius*.

## 1. LOPAPHUS BRACHYPTERUS.

*Phasma brachypterum*, DeHaan, Orthopt. Orient., p. 125, pl. xiii, fig. 2, ♀.

*Lopaphus brachypterus*, Westwood, Monogr. Phasm., p. 99, ♀.

HAB. A single specimen of the adult female was captured, with several larvæ of the same sex, by my native collector at Johore in the Malay Peninsula; Sumatra (*DeHaan*).

Well-developed organs of flight in both sexes.

## 2. LOPAPHUS IOLAS, Pl. III, Fig. 2, ♀.

*Necroscia Iolas*, Westwood, Monograph *Phasmidæ*, 1859, p. 145, pl. xix, fig. 2, ♂.

*Lopaphus Iolas*, Wood-Mason, J. A. S. B., 1875, Vol. xlv, pt. ii, p. 217, ♂ ♀.

*Cantantes Sparnius*, Stål, Recens. Orthopt., III, p. 87, ♀.

HAB. Numerous males and females and larvæ captured at Johore by my native collector; Malacca (♂ *A. R. Wallace*, ♀ *C. Stål*). The typical specimen of the male is now in the Hopeian Collection at Oxford.

Tolerably well-developed organs of flight in the male, but rudimental tegmina only in the female.

## 3. LOPAPHUS PORUS.

*Lonchodes porus*, Westwood, Monogr. *Phasmidæ*, 1859, p. 42, pl. vii, fig. 9, ♂.

" " Wood-Mason, P. A. S. B., 1877, p. 162, ♂ ♀.

HAB. Throughout the valley of the Houng-da-rau, Upper Tenasserim.

The male has minute rudiments of organs of flight, the only vestiges of which in the female are four minute yellowish spots.

## 4. LOPAPHUS BOOTANICUS, Pl. II, Fig. 1, ♂.

*Lonchodes Bootanicus*, Westwood, Monograph of *Phasmidæ*, 1859, p. 43, pl. xxvi, fig. 8, ♀.

A male and a female from Sámagúting measure:—

♂. Total length 3 inches 3.75 lines; head 1.5; proth. 1.75; mesoth. 9.75; metath. 4.75; abd.  $18.25 + 3.75 = 22$ ; antennæ 3 inches 5 lines. (*Type*).

♀. Total length 4 in. 0.5 line; head 2.5; proth. 2.75; mesoth. 11.25; metath. 5.25; abd.  $22 + 4.75 = 26.75$  lines; antennæ 3 inches 3 lines.

The typical specimen of the female in the India (formerly East India Company's) Museum, S. Kensington, a much shrivelled and mutilated insect, wanting the terminal segment of the abdomen, is rather larger and consequently proportionately slightly longer as to the mesothorax than the specimen of which the measurements are given above: in it the mesothorax and metathorax exactly measure 13.5 and 5.75 lines respectively.

HAB. The only precise locality for the species which it is at present in my power to give is Sámagúting, Nágá Hills, whence specimens preserved in alcohol have been sent to me by Captain J. Butler, and are now in the Indian Museum.

The organs of flight have entirely disappeared from this as well as from the following species.

#### 5. LOPAPHUS BAUCIS, Pl. II, Fig. 2, ♂.

*Bacteria Baucis*, Westwood, Monogr. *Phasmide*, 1859, p. 21, pl. viii, fig. 8, ♀.

*Lonchodes Baucis*, Wood-Mason, *l. s. cit.*

HAB. Abundant in the neighbourhood of Sibságar, Assam, whence I have received numerous individuals of both sexes—dried as well as in alcohol—from my valued correspondent, Mr. S. E. Peal, to whom I am also indebted for coloured sketches and much information respecting *Phasmide* and other Arthropods. And apparently throughout the N. E. frontier country.

The accompanying figures were taken from one of the numerous specimens collected by Mr. Peal.

I have examined the typical specimen of the female preserved in the National Collection, and I find that the stiff brown bristles figured and described by Westwood as fringing the sides of the abdomen at its base are present on one side of the body only, that they have no organic connection with the integument of the insect, and that some similar bristles lie scattered quite irregularly over the basal joints of the adjacent leg, like spicicans spilled upon a table; moreover, no trace of such setae is detectible in a specimen of the same sex and species placed alongside of the type in the same drawer, nor in any one of the multitude of specimens in the Indian Museum. The setae, which are apparently of a vegetable nature, have evidently got jammed between the dorsal and ventral arcs of the segments as the membrane connecting these at the sides contracted in drying.

#### NECROSCIA PHÆTUSA.

*N. Phætusa*, Westwood, Monogr. *Phasmide*, p. 137, pl. xxxviii, fig. 4, ♂.

*N. Gargantua*, id., op. cit., p. 130, pl. xxix, fig. 3, ♀ as male.

On my informing Professor Westwood that his *N. Gargantua*, which from the mutilated condition of the terminal segments of the abdomen and from the presence of ocelli he had felt compelled to describe as a male, was in reality of the opposite sex, he at once pointed out *N. Phætusa* ♂ as its true and legitimate partner.

HAB. A perfect specimen of the female, captured by my native collector on Sinkieb Island, is in the Indian Museum. The typical specimens

in the Hopeian collection at Oxford were both collected by Mr. A. R. Wallace, at Sarawak, in Borneo.

*Obs.* It is possible that the Sinkieb specimen, when actually compared with Westwood's typical one, may turn out to differ in much the same manner as the species of *Bacteria* from the same island does from *B. Sarawaka*, Westw.

#### NECROSCIA HILARIS.

*Phasma (Necrosia) hilare*, Westwood, Cab. Orient. Entom. p. 77, pl. 38, fig. 1, ♀ (*Assam*).

*Necrosia hilaris*, id., Monogr. Phasmidæ, p. 155, ♀.

„ *Virbius*, id., op. cit. p. 154, pl. xvi, fig. 2, ♂ (*Malacca*).

The Indian Museum has long possessed numerous examples of *N. hilaris* ♂ ♀, both from Sikkim (*L. Mandelli*) and from the neighbourhood of Sibságar, Assam (*S. E. Peal*); but the identification of the male as *N. Virbius*, Westw. was only recently made by Professor Westwood and myself while looking through the collection of *Phasmidæ* in the Oxford Museum.

#### NECROSCIA MENAKA.

*N. Menaka*, Wood-Mason, Ann. & Mag. Nat. Hist., 1877, Ser. 4, Vol. xx, p. 130, ♀.

“ ♀. Body elongate, stoutish, of tolerably uniform width throughout. Head large, oblong, parallel-sided; vertex divided by three notches into four tubercles. Pronotum shorter and narrower than the head, flat, with a few minute granules. Mesothorax slightly tapering from the insertion of the legs forwards, granulate above and below and on the sides; its dorsal are longitudinally carinate, granulate along the top of the ridge and at the edges. Abdomen tapering slightly from the base to the emarginatè apex, which carries a longitudinally carinate semioval plate; its terminal segments, dorsal and ventral, constructed much as in *Necrosia Salmanazar*, *N. maculicollis*, and *N. Sparaxes*, in all three of which also the sixth ventral segment is furnished at its hinder extremity with a peculiarly shaped process, which serves as the *point d'appui* for the claspers of the male during copulation.\* Legs long and stout; the fore tibiæ and the femora and the tibiæ of the two posterior pairs subtriquetrous and carinate along the middle of the under surface. Tegmina oval, with but a slight compressed conical elevation of the carina. Wings reaching about to the end of the fifth abdominal segment; the costal area luteous brown, like the body and legs; the costal vein divided at the middle of its length, the two branches uniting again near the extremity; posterior area milk-white, conspicuously

\* A fact ascertained by actual observation in *N. maculicollis*.









